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THE UNIVERSITY OF ALBERTA

STYLES OF KNOWLEDGE:
MYSTICISM, MAGIC AND SCIENCE

by

ⓒ CAROL URQUHART-ROSS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled: STYLES OF KNOWLEDGE: MYSTICISM, MAGIC, AND SCIENCE submitted by CAROL URQUHART-ROSS in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Sociology

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ABSTRACT

Epistemology approaches knowledge as a unitary entity. Yet those people who have labored to expand the frontiers of knowledge have expounded no such view. Examination of claims to knowledge indicates that there exists considerable divergence in style. Practitioners vary in terms of their assumptions, their definitions of knowledge, and the methods which they employ in order to acquire knowledge. Such difference reflect in turn on the stance which they adopt in facing the world, particularly with respect to questions of transmission of knowledge to new practitioners and to the world at large.

There is a tendency for each practitioner to operate in affiliation with colleagues who share his approach. Therefore the search for knowledge can be seen to operate from within stable traditions, or systems. Three major traditions have predominated in this quest, mysticism, magic, and science. This dissertation examines the nature of the search for knowledge within these three traditions using practitioners accounts as the principal source of information.

Throughout the emphasis will be an elucidation of the way in which practitioners develop logical relations uniting assumptions, definitions, methodology, and techniques of transmission such that their enterprise has coherence. The fact that this coherence is almost purely internal cannot be over emphasized. We will also

demonstrate both the divergence among the three systems as well as the areas of significant overlap together with accounts describing the basis of these developments.

The major theoretical device employed in this task is what we term the public-private continuum. This refers to the central focus in each system; be that wholly interior or predominately exterior. The particular emphasis chosen has significant consequences for the kind of knowledge sought, the character of the product, and most significantly, for the nature of verification. As we show, mysticism is a system of virtually complete private focus; science one of public focus, and magic represents a curious amalgam of public and private.

Finally we attempt to assess the significance of this discussion in order in part to enhance our basic understanding of the three systems. The promise and satisfactions inherent in each are considered as are the dilemmas for social control presented by the very existence of each approach.

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I

INTRODUCTION

The search for knowledge has long pre-occupied mankind. We commonly say that knowledge is power. In its guise of power, or the key to power, knowledge has been sought in the attempt to extend our control over the environment - both physical and social. In this aspect it is valued as instrumental, as a potent tool with which we can accomplish our ends.

The value accorded knowledge is not only instrumental. The human species is a curious one; we credit knowledge with an intrinsic value. That is to say, the satisfication of curiosity is seen as bringing peace, happiness, and a sense of accomplishment - even when the satisfaction is an end in itself. This dual evaluation as good both intrinsically and instrumentally reflects our divided preoccupations with comprehension and control.

Although we cherish knowledge, and ardently pursue it, its nature remains mysterious. Answers to questions such as: "What does it mean to know?" "What can be known?" "Are there limits to knowledge?" "How do we know what is authentic knowledge?" remain elusive. The more reflective our attending to the concept becomes, the more it appears to recede into shadow.

Dictionary definitions are inadequate solutions to the problem. To know (excluding its sense of recognition which in a more orderly language such as French is accorded a distinct word) is defined as follows:

- to apprehend immediately with the mind or with the senses.
- to perceive directly.
- to have cognisance, consciousness, or awareness of.
- to apprehend with certitude as true, factual, sure, or valid.

Knowledge is defined as:

- a fact or condition of possessing within mental grasp through instruction, study, research, or experience one or more truths, facts, principles, or other objects of perception.
- any body of known facts or any body of ideas inferred from such facts or accepted as truths on good grounds.

(Websters, 1966)

Why are these definitions inadequate for our purpose? We know that our sense perceptions can be in error as reflected in our concept optical illusion. Therefore what we sense or perceive may deceive us. Similarly our consciousness or awareness may be inaccurate. Again, we have a concept; namely false consciousness, which depicts such a condition. It follows that that which we are taught, and that which we study or investigate, is susceptible to similar error. We can therefore be certain of the truth of that which is false. Such a conception collapses the notion of knowledge to that of rational belief. Yet such a notion does not conform to our convictions concerning the nature and substance of knowledge. We require more, but what more?

These questions have been the traditional concern of epistemology - literally the study of knowledge. This discipline attempts to clarify the nature of knowledge through the tool of rational analysis. Its task remains unfinished. However, there are certain very general kinds of statements which can be drawn from this enterprise.

Butchvarov, in a recent work, states that the epistemologically "widely accepted account" of the nature of knowledge is that we can be said to have knowledge when three conditions are fulfilled:

a) that it is true that it is the case.
(truth)
b) that it believes that A is the case.
(belief)
c) that it has sufficient evidence that A is the case.
(sufficiency)

(1970:25)

This is the "philosophically important and conceptually distinctive sense of know"; "knowing that something is the case." (1970:25)

These criteria for knowledge serve to establish clear analytical distinctions between knowledge and belief. As Butchvarov states:

> The requirement that for knowledge we must have, in addition to belief and truth, evidence or reasons or a basis is what distinguishes knowledge from true belief. The requirement that the evidence we so have must be sufficient, that is, must come up to some standard, is what distinguishes knowledge from rational belief.
>
> (1970:44)

The content of the notion of sufficiency of evidence, he reminds us, is by no means simple, or self evident.

Sufficiency of evidence, for example, does not mean:

a) that the evidence supporting the belief is stronger than the evidence suggesting that the belief is false.

b) that the best possible evidence supports the position; i.e. expert opinion.

c) that the evidence supporting belief is the best possible logically; eg. "best argument for the existence of God".

d) that the evidence is sufficient to justify belief in a "reasonable man".

e) that there is no available contrary evidence.

f) that the evidence would justify one in saying that one knows.

g) that doubt is rendered unreasonable.

(1970:45-46)

Just what does constitute sufficient evidence remains the subject of debate. Butchvarov suggests that:

> ...knowledge is the absolute impossibility of mistake.
>
> (1970:51)

> ...one who has sufficient evidence, in the sense described, that a certain proposition is true can indeed guarantee that the proposition is true, for the evidence makes the falsehood of the proposition absolutely impossible.
>
> (1970:54)

The remaining two criteria are equally essential in the clear definiation of the concept. Belief is warranted in that one cannot be said to have knowledge which one was not aware of possessing. It is equally absurd to speak of knowing A to be the case when one does not believe that A is the case. Butchvarov adds that the notion of false knowledge is logically incoherent thereby necessitating inclusion of the criterion of truth. (1970:25)

The epistemological solution to the problem of knowledge leaves us with the inescapable conclusion that much if not most of what passes for knowledge is bogus. What appears at the time to be true belief sufficiently warranted all too often turns out to be false. The notion of false knowledge may be logically incoherent, yet the category of false knowledge is one which, in practice, confronts us at every turn.

Butchvarov himself recognizes this problem. He remarks that the concept "know" falls into a group of terms which lend themselves to exaggeration.

> By using the word (to know) even though illegitimately, one can encourage important actions, gain respect and admiration, cause attitudes one regards as desirable, and even acquire the confidence one needs to achieve difficult ends.
>
> (1970:55)

Much of what we claim as knowledge then, according to epistemological criteria, is not knowledge but rather rational belief, true belief, or simple belief. The epistemological analysis of knowledge provides us with "an ultimate" standard against which we can measure our efforts at truth seeking and by which we can give direction to these efforts. This standard, Butchvarov declares, is significant even if unattainable. (1970:61)

The fact remains that the epistemological analysis, while valuable in its own right, dedicates its purpose to something which bears little resemblance to actual experience. There is a large discrepancy between epistemological and routine criteria of knowledge. Recognition of this fact prompts us to turn our attention to the question of the criteria of routine knowledge. That is to say, there is a sizeable body of relief, lore, and information which does not fulfill the epistemological criteria of knowledge. It is nevertheless routinely considered to be knowledge. We wish to discover which criteria delineate this body of "knowledge". How is the title conferred upon it?

Two possible foci for such an investigation are readily apparent. One might choose to examine "community" standards of knowledge; what might be called "common knowledge". Alternatively, one might choose to investigate the judgements and requirements formulated by those who devote themselves to the acquisition of knowledge - what might be called 'professional knowledge'. This second option was the choice for this particular analysis.

The first observation which one makes upon an examination of a variety of works purporting to extend knowledge, is that no one set of requirements or standards dominates. The knowledge seekers themselves disagree concerning the properties of knowledge. Closer scrutiny reveals that the disagreement is not wholesale - the situation is one of opposing factions or camps rather than anarchy. The pursuit of knowledge occurs, in large part, within the confines of clearly defined traditions. Within each tradition criteria of knowledge are evolved and become institutionalized. These traditions serve as the standard to guide practitioners in their endeavors. Outside of the confines of the tradition however, these standards may be, and frequently are, repudiated. Thus, when we move from epistemological analysis of knowledge we move from a situation of a single standard to one in which a diversity of standards compete.

Three such traditions have been selected for comparative analysis in this work. They are as follows: mysticism, magic, and science. Each represents a distinctive solution to the problem of knowledge. Each tradition in addition represents an entity present in diverse cultures, surviving the passage of time. A brief account describing the three traditions follows.

Mysticism refers both to an experience and to an intellectual enterprise founded upon the interpretation of this experience. The dictionary tells us that mysticism in this sense is:

- the experience of mystical union or direct communion with ultimate reality reported by mystics.
- a theory of mystical knowledge: the doctrine or belief that direct knowledge of God, of spiritual truth, of ultimate reality, or of comparable matters is attainable through immediate intuition, insight, or illumination and in a way differing from ordinary sense perception or ratiocination.

(Websters, 1966)

Mysticism therefore involves the acquisition of knowledge by a direct experience or encounter with the reality known. The cultivation of this experience will then form the principal method of mysticism. Mystical practice thereby involves the manipulation of the self in order to accomplish mystical union.

Magic has been defined as

- the use of means that are believed to have supernatural power to cause a supernatural being to produce or prevent a particular result considered not attainable by ordinary means.
- an extraordinary power or influence seemingly from a supernatural source.
- of or relating to the occult.

(Websters, 1966)

Magic involves the manipulation of forces, or beings, or powers. The notion of the supernatural nature of the enterprise emanates from the potent nature of predicted outcomes. The results are thought to transcend man's 'natural' capatities. The manipulation of these forces requires knowledge and at the same time confers knowledge but, as we shall show, knowledge of a special kind - appropriate to the system of magic, incomprehensible and unacceptable outside of this tradition.

Science has been defined as

- accumulated and accepted knowledge that has been systematized and formulated with reference to the discovery of general truths or the operation of general laws.
- a branch of study that is concerned with the observation and classification of facts and especially with the establishment or strictly with the quantitative formulation of verifiable general laws chiefly by induction and hypothesis.

(Websters, 1966)

Science deals with the interrogation of empirical reality, unlike the mystical enterprise which finds its focus in the mind of the practitioner, or the magical discipline which concentrates on the practitioner and the transcendent. One would expect that the knowledge of science bears little resemblence to that of mysticism or magic, and with a few qualifications, one finds this to be the case.

The three disciplines therefore have qualitatively distinct intentions. This much is clear from the most cursory analysis. The task of this analysis is to reveal in detail these differences and, to demonstrate the consequences for knowledge that these diverse orientations have when applied.

The task then is the critical analysis of three distinct approaches to knowledge. It is recognized at the outset that the claims to knowledge which issue from any one system are unlikely to be acknowledged by competing systems. The independent assessment of the validity of these claims rests with epistemology. It will not occupy our attention in this work since extraneous judgments of validity do not occupy practitioners within a system. Rather, we are concerned with internal judgments - how do practitioners utilizing a particular frame of reference operate so as to extend knowledge? How do they distinguish between pretensions and legitimate claim?

Preliminary analysis indicated that four general themes united the systems into coherent wholes. These themes will provide the organizational framework of the dissertation.

The first of these themes is basic assumptions. Each enterprise is founded upon a few, usually tacit, assumptions about the nature of the universe. In the light of these assumptions the enterprise is justified as making legitimate claims to knowledge. We will elucidate these assumptions, comparing those instrinsic to each system. Finally the internal assumptions will be compared and contrasted with those made by external assessors of each system.

The second major theme concerns definitions of knowledge.

Here we will consider the definitions of knowledge employed within each system. Clearly the definitions employed will relate substantially to the assumptions of each system. That is, the view of the cosmos adopted dictates one's conception of knowledge to a certain extent." In particular, the assessment of what is possible limited and shaped by one's view of the forms and relationships of the universe, and of man's place within these forms and relations.

The third theme, method is also intimately bound up with the issue of definition. It is not enough to desire knowledge. One must also work in order to acquire it. When practitioners start from different initial assumptions and use divergent definitions of knowledge, it is reasonable to assume that the methods applied in the search will also be diverse. Our treatment of this theme will first establish precisely what are the methods employed by each system. We will then consider the way in which each method is justified and becomes coherent from the context of intent, assumption, and definition. In other words we wish to examine the way in which the particular methodology is made reasonable for practitioners. Again we will attempt to engage in comparison in order to demonstrate the extent to which, because of distinctions in intent, assumptions, and definitions, a method which is both reasonable and appropriate for one tradition appears to be unreasonable and inappropriate from the perspective of another.

The final theme to be considered is transmission of knowledge. Any search for knowledge requires certain systematic preparation. We will examine the kind of preparation or training given novices within each system as well as considering the personal qualities deemed significant for success in the enterprise. Clarification of such issues may increase the understanding of the basic nature of the enterprise in question. For example, such clarification may illuminate the methodological requirements employed in each enterprise. A second issue is considered in connection with this theme, namely, the relation between knowledge and practice. As was mentioned earlier, man seeks knowledge for a variety of reasons. The reasons for which knowledge is sought are revealed in part through an examination of the uses to which acquired knowledge is put. Thus an examination of the practical intentions of a discipline helps to clarify the essential claims of that discipline. Such an examination is also useful in highlighting the differences between the various systems to the extent to which these are revealed in basic intent.

The strategy throughout will be to illuminate the relations uniting the primary assumptions, definitions, methodology, and techniques of transmission. We wish to reveal the way in which these relationships allow us to see the enterprise as a coherent whole. In other words, we wish to clarify how it is that these relationships operate so as to allow us to speak of "science", or "mysticism", or "magic". The second pervasive concern is that of providing a basis of comparison of the three approaches. We wish to demonstrate the ways in which the three systems diverge and to explore the systematic basis for this divergence. In addition, we wish to examine the extent to which the approaches overlap or manifest some basic compatibility. Finally, the analysis will conclude with an attempt to assess the systems in terms of their potential contributions and inherent limitations. A crucial feature of this discussion will be a treatment of the respective attractions of the systems.

METHOD

The three approaches to knowledge considered here have been examined in a number of ways by many disciplines. The philosophy of science has provided formal analysis of the nature and methods of science; although this analysis has not necessarily provided an accurate reflection of the working activities of scientists. Sociology of knowledge has attacked the problem with the aim of locating and analyzing of the "existential determinants of knowledge".

Both magic and science have been subjected to functional analysis by sociologists and anthropologists in order to separate questions of practitioners' avowed intentions from those of underlying social functions. Mysticism has been treated by theologians of every persuasion and mystics' claims examined by psychologists in order to trace the causes and correlates of the mystical experience.

The approach of this work is intended to supplement not to supplant these endeavors. While not denying the utility of such investigations, we argue that they typically fail to give adequate attention to practitioners' claims. Because practitioners within any of the systems operate on the basis of certain assumptions, intentions, and beliefs; we feel that these assumptions, intentions, and beliefs must be assessed in order to achieve a more complete understanding of any of the systems. We therefore intend to take practitioners' claims at face value with the goal of providing an analysis of their intentions and of the techniques by which they translate these plans into perceived extensions of knowledge.

The primary source of information therefore will be the accounts which working practioners have given of their efforts. We will concentrate on scientists' descriptions of their labors, mystics' versions of their visions and methods, magicians' depictions of the aims and techniques of ceremonial magic. Supplementary material in the form of biographical work and scholarly treatments of each system from alternative perspectives will be incorporated in the discussion.

Obviously the number of practitioners involved precludes the possibility of reviewing each practioner's work. At the same time we cannot be certain that the views of a given practioner reflecting upon his discipline will be characteristic of practitioners as a collectivity operating within that tradition.

This poses a dilemma in the attempt to depict areas of broad consensus within each system. Several related strategies were employed as at least partial solutions to this problem. First, as many practitioners as possible were reviewed. Care was taken in addition to ensure that work from a number of historical periods and different settings was included. Review continued until consensus in the matter of the central themes became strong and apparent. Finally, emergent discrepancies and disagreements are noted and incorporated into the analysis.

CENTRAL THEME

Throughout the analysis, a concept which we have termed the public-private continuum will be utilized as a primary descriptive device. Two polar positions along this continuum can be envisaged. A wholly private conception of knowledge involves an emphasis on the production of 'sages'. Knowledge is embodied in these men and is utilized by them, acting alone. Knowledge is therefore not accessible for public scrutiny or assessment and its employment is not subject to community controls. Methods of acquiring this private knowledge will then center in the person of the sage, transmission will feature 'tests of personal worth' rather than teaching of skills.

This extreme can be contrasted with the opposing end of the continuum - public knowledge. In a purely public conception statements of fact are the product desired by practitioners. These statements are objective, open to public scrutiny and assessment. Once discovered they become public property in the sense that their usage is in no way associated with or dependent upon their discoverer. Public conceptions therefore clearly delineate a separation between the knower and the knowledge in a way that private conceptions avoid.

The location of each system of knowledge on the public - private continuum may provide a useful insight into the organizational logic of the assumptions, definitions, methods, and modes of transmission of each system. On the basis of our analysis, it appears that mysticism represents a close approximation to the extreme private case. Science similarly aligns itself at the public end of the continuum. The system of magic will be shown to represent a fascinating attempt to combine features of both public and private conceptions. Magic uses a mixture of methodologies - appropriate to both schemes and paralleling those of science and mysticism in order to produce sages whose knowledge can be used in a fashion mirroring the uses of an objective public knowledge. Magic then will be shown to be both subjective and objective; public and private in conception.

II

BASIC ASSUMPTIONS OF MYSTICISM

INTRODUCTION

Accounts purporting to 'explain' mysticism have all too frequently failed to provide a clear delineation of the discipline. Accordingly, we find the phenomenon indiscriminately categorized by proponents of the traditional psychological approach as one manifestation of mental illness indistinct from or symptomatic of schizophrenia, manic depression, or paranoia. Students of religion have failed along similar lines, but in a different direction, to distinguish mysticism from simple devotion. Both extremes result in a loss of recognition of both the integrity of the discipline and the cognitive nature of its intentions. For mysticism proposes a theory of knowledge and a methodology developed in accordance with this theory. No understanding of mysticism can occur unless the stated intentions of the practice, however misdirected we might find them, are acknowledged.

Consequently, this chapter will address itself to two major tasks. First the problems associated with both the devotional and psychological models of mysticism will be explored. Following this we will consider the assumptions which form the foundation of the mystical theory of knowledge in order to explicate the mystics' beliefs concerning the nature of their enterprise.

THE DEVOTIONAL MODEL

Mysticism often is equated with manifestations of religious enthusiasm. Auden's work on Protestant mysticism (1964) for example, is characteristic of this approach. In this view any experience of devotion which is powerful and personal is considered to be an instance of mysticism. The practice is therefore seen as indistinguishable from such disparate occurences as: the conversion experience, spiritual renewal, fervent prayer, speaking in tongues, faith healing, or a generalized feeling of religious awe. Mysticism defined in such terms strongly emphasizes the emotional aspects of the experience to the virtual exclusion of the intellectual.

Partial support for this approach can be drawn from accounts of mystical union which do indeed typically stress both intense emotion and religiosity. There is, however, a sloppiness of characterization which limits the usefulness of such a system of classification. First, mysticism is not a purely devotional phenomenon. There have been, for example, instances recorded of a 'nature' mysticism which is not identifiably religious in nature (Zaehner, 1957; Happold, 1963). Indeed, it is thought that there is a close relation between the mystical experience and the more generalized notion of 'inspiration'. Second, even purely religious mysticism is characterized by a cognitive intent and rigorous methodology which renders it quite distinct from such spontaneous emotional experiences as speaking in tongues. The devotional characterization of mysticism conceals this intellectual component of the practice as well as its highly systematic methodology.

Andrew M. Greeley expresses this point with great clarity:

> Most social scientists are unwilling to take mystics at their own words. The psychotherapist says the ecstatic has experienced something 'rather like schizophrenia'; the Esalen psychologist says the mystic has been through a 'feeling state of heightened consciousness'. Such characterization doubtless helps researchers to organize their work; however, in doing so they are paying little heed to what the mystic says happened. According to him, the experience is more one of knowing than of feeling. If anything is heightened in the ecstatic interlude, it is the cognitive faculties of the mystic: he knows something others do not know and that he did not know before. He sees, he understands, he perceives, he comprehends... They (psychologists) don't realize that, above all, the mystic knows that cognition is at the core of his experience.
>
> (1974:4)

It is this special technical sense of the term mysticism which will occupy our discussion. A significant distinction which must be drawn is that between the mystical experience and mysticism. Mysticism refers to a deliberate and systematic cultivation of the mystical experience for the express purpose of acquiring 'enlightenment' or knowledge from the pursuit. There can be mystical experience without mysticism but no mysticism without the mystical experience.

The deliberate cultivation of altered states of consciousness is the focal point of technical mysticism. (Hereinafter referred to simply as mysticism.) This activity is referred to as contemplation which Zaehner defines as individual concentration:

> ...on an ultimate reality to the complete exclusion of all else; and by 'all else' is meant the phenomenal world.
>
> (1957:33)

Mysticism itself then, can be defined as the deliberate cultivation of:

> ...praeternatural experiences in which sense perception

> and discursive thought are transcended in an immediate apperception of a unity or union which is apprehended as lying beyond and transcending the multiplicity of the world as we know it.
>
> (Zaehner, 1957:198)

PSYCHOLOGICAL DISORDER

The second principal classification of mysticism considers it one with psychological disorders and disorientations of various kinds. The argument proceeds along several different fronts. First, it is maintained that the characteristics of a mystical experience are identical to those induced through the use of mind disorienting situations and substances. Second, it is asserted that mystics exhibit symptoms of mental illness and that these symptoms explain their behavior and convictions as mystics. Third, patients diagnosed as suffering from mental illness frequently describe experiences similar to those of the mystics. It is therefore asserted that the experiences themselves must be identical and those of the mystics pathological. Finally, it is argued that practices assoicated with mystical training are aberrant - they are contrary to the maintenance of mental health.

The fact that hallucinations can be induced through the manipulation of the sensory environment is well documented (See for example MacDermot, 1971). Many of the conditions employed by mystics as aids to contemplation are included in a list of such situations; for example: isolation, fatigue, sensory deprivation, fasting, sexual excitation. It is asserted that because mystics as part of their method employ techniques which are commonly associated with hallucination, the mystic experience must then be simple hallucination and nothing more. On a similar line Lueba notes that descriptions of mystical experiences bear marked similarity to those of persons who have ingested some mind-altering substance. These reactions include "alteration of sensation and feeling" (1925:27) and "alterations of intellectual functions and of emotional attitude" (1925:29). Substances known to produce such effects include: alcohol, mescaline, peyote, hashish, ether, nitrous oxide, L.S.D. In many cultures such substances are commonly used to induce mystical trance or ecstasy, although such use is typically discouraged by advanced contemplatives. Given the assumption that similar method produces a similar result, the mystical experience is seen as nothing more than intoxication. Thus, mysticism becomes the delusion of the intoxicated.

The second argument, that mystics display symptoms of mental illness, is advanced through use of the technique pioneered by Freud in his psychoanalysis of Leonardo da Vinci (1947). Often the mystics own memoirs are used for this purpose, supplemented by biographical material. Underhill, for example, states that mysticism is frequently equated with hysteria, auto-suggestion or neurosis (1970:266). Leuba (1925) points to the similarity in symptomology between mysticism and some forms of epilepsy.

The life of Saint Teresa of Avila has provided fuel for these claims. Wapnick, discussing a psychoanalytic account of her life, suggests that the following kinds of symptoms can be demonstrated:

1. primary regression
2. break with reality and loss of object relationships
3. feelings of apathy and loss of interest in the world
4. severe affect disturbances and fluctuations in mood
5. depersonalization
6. hypocondriasis
7. expressions of sexuality (?)

8. restitutional symptoms
9. delusions
10. hallucinations

(1968:53)

Further, he suggests that:

> The content of many of Teresa's visions manifest these sexual origins; namely, the revival of her repressed infantile sexual desires to sleep with her father. Her life long goal of union with God can be understood as the displacement of her frustrated and repressed sexual desires for her father. Her ego could not contain these impulses, however, and the sexuality of her visions and delusional content evidence the breakthrough of these feelings. Visions where she perceived a blending of light or radiance reflect this Oedipal striving more symbolically.
>
> (1968:59)
>
> ...In summary, Teresa's life can be understood as consisting of the struggle to resolve the Oedipal situation.
>
> (1968:62)

The third argument is developed in Zaehner's work (1957). He compared descriptions of the mystical experience found in the works of contemplatives with the characterizations of ecstatic periods made by selected manic-depressive patients. Finding no significant differences between them, he concluded that it is virtually impossible to distinguish between examples of mystical experience and those of mania. (He does allow that there are marks which distinguish the advanced contemplatives). In many important senses this is true. Mystics do live in a 'different world'. Their lives have a different pattern. They renounce things and relationships which others value. They indulge in strange practices, mortifications, and humiliations. They see and hear things not apprehended by others. Their moods are variable - often they are in states of exhaltation or trance. By most of our traditional criteria, they could well be considered to be insane. The question remains, is such a classification fruitful? Does it advance our understanding of the nature of mysticism or is it simply a form of sophisticated name calling?

The final argument is that of the unwholesomeness of many of the techniques of mysticism. It is held that practices which damage the health or involve the mutilation of the body indicate a basic unsoundness - an error in method. As Leuba states:

> ...the final earthly condition of the faithful, uncompromising Yogim, as he appears to the unsophisticated observer, does not seem to be worthy of man's holiest endeavours. The emaciated, bewildered ascetic, reduced to the dimmest spark of life, equally incapable, for lack of energy, of committing good or evil, is not a demigod but a shrunken caricature of what man ought to be - so at least does common sense pronounce....His self deception, the corresponding self-deception of the user of drugs, and, as we shall see, of the classical Christian mystics, constitute one of the most pathetic chapters of human history. To aim so high and yet to fall so low is in truth both deep tragedy and high comedy.
>
> (1925:46)

This should be qualified. Many practices, notably smoking, drinking, over-eating, use of drugs, ear piercing, involve both damage to health and mutilation. They are enjoyed for reasons much less noble than those justifying the mystics' practice. However, they are viewed as both 'natural' and acceptable. It seems that the practices of the mystics suffer rather more from that of harmfulness.

The psychological model fails to convince. Only a person who has rejected _a priori_ the possibility of a genuine mysticism would find the arguments sound. In general, the contentions of this approach can be met with the assertion that similarity does not entail identity. The fact that some aspects of mysticism resemble some aspects of mental illness does not mean that there is a basic identity. Similar parallels can and have been drawn between aspects of the scientific enterprise and symptoms of mental disturbance (Maslow, 1969). We do not however, accept these interesting parallels as a condemnation of the enterprise of science.

Many people in all walks of life can be shown to exhibit symptoms of mental disturbance. We do not allow these unfortunate occurrences to color our appreciation of the contributions of these people. We do not discredit the work of a neurotic scientist on the basis of his neurosis. There is no reason to abandon our distinction between the man and his work in the field of mysticism. Further, many of the characteristics of the mystical experience are simply designated as symptomatic of disease without justification. In other words, we define those who undergo mystical experiences as 'ill' (either temporarily or chronically depending on the intensity and duration of their experiences.) It is hardly surprising that we find in consequence many of the 'mentally ill' demonstrating 'symptoms' similar to those of mystics who have successfully eluded our diagnostic tests. The situation appears to be one of 'explaining' a phenomenon by substituting one terminology (in this case that of mysticism) for another (in this case that of clinical psychology) with the associated changes in connotation. This is a familiar form of explanation in the social studies, but one which fails to satisfy the requirements of the science which it purports to represent. In other words, we must have some kind of evidence on which to base our judgment when we decide to call one man's vision a delusion or hallucination. The psychological model has failed to produce adequate evidence to support their claim to this end.

The final argument of the model falls in the same manner. Many mystics acknowledge that excessive zeal which results in physical harm is an error in method. It therefore seems inappropriate to use the errors in judgement of a minority to bring discredit to the whole system. However, even if excessive zeal was not considered to be an error, even if all mystics mutilated their bodies and thereby caused bodily harm of a serious nature; it would still not follow that the phenomenon of mysticism itself was inauthentic. We must remember that our disapproval of a practice does not necessitate the practice's impotence. In theory, a technique can be dangerous, unhealthy and possibly even 'perverse' but nevertheless be productive of knowledge. In considering those intellectual pursuits to which we are unaccustomed we must be careful to avoid confusing the "is" with the "ought" and the "should not" with the "can not".

Finally, the argument of artificial induction of trance is itself a two-edged sword. Since the mystics themselves argue that contemplation occurs when ordinary consciousness has been altered; the fact that such altered states can be induced through sensory and chemical manipulation hardly damages their contention. This is all the more true since they argue that altered consciousness is a necessary but not sufficient step to illumination. Many in fact, taking Huxley (1963) as their guide, have turned this argument on its head using it to advocate freer consumption of consciousness-altering drugs.

MYSTICS' MODEL - BASIC ASSUMPTIONS

Both the devotional and the psychological models have been shown to be unsatisfactory explanations of the phenomenon. Needless to say, the mystics themselves have an entirely different model, based on the initial assumption that mysticism can be an authentic or genuine phenomenon. Their assumptions take the contemplative experience at face value and serve to explicate the conditions under which it is possible. This explication therefore serves as a model of a universe in which the pursuit of contemplative experience can serve as a source of genuine knowledge.

The first assumption basic to mysticism concerns the hunger for truth. It is assumed that man hungers for knowledge just as he hungers for food. Mystics claim the mere presence of this hunger justifies operating on the assumption that there exists truth which would satisfy such hunger.

> More reasonable that the rationalists, they find in that very hunger for reality which is the mother of all metaphysics, an implicit proof that such reality exists; that there is something else, some final satisfaction...
>
> (Underhill, 1970:23)

Mysticism is seen as an answer, perhaps the only answer to this craving. It represents:

> ...a desire of the soul - felt to be sacred, preceeding any rational justification and sometimes unconscious yet profound and irresistable - which urges it into contact with what it holds to be absolute.
>
> (Ancelet - Hustache:5)

The mystics believe that it is self evident that man hungers for truth. This hunger demonstrates the existence of the thing to be known. The existence of mysticism then represents both the proof of the hunger and the method of satisfaction.

The second assumption is of the imperfection of the senses. The senses, it is argued, provide flawed representations of reality. This recognition is common to all systems of knowledge. We learn early that we cannot always trust what our eyes see. The mystics suggest that sense data, because it is imperfect, is insufficient to satisfy the craving for truth which, by definition, is perfect. Again this assumption is common to all of the systems of knowledge. However, rather than attempt to refine the sense data, limit the distortion; the mystics suggest that sense data be abandoned in the search for knowledge. They counsel the use of alternative sources of information.

> One after another, with extraordinary unanimity, they have rejected that appeal to the unreal world of appearance which is the standard of sensible man: affirming that there is another way, another secret, by which the conscious self may reach the actuality which it seeks.
>
> (Underhill, 1970:23)

This distrust of the information obtained from the senses leads to the third assumption, that of duality. The assumption of duality does not mean that the mystics believe in the existence of two separate realities. Rather they believe that ultimately in the large picture, there is but one universe or reality. There are, however, two aspects to this reality - mind and matter. In practice these two aspects are so independent as to be virtually separate. They are hierarchically ordered; matter being the lower or inferior aspect, mind the higher or more perfect. This organizing principle is ubiquitous: even man is not exempt. Man's familiar self is considered to be matter; his soul mind. This scheme represents mystics more than a convenient organizing device. It has the profoundest significance for questions of knowledge. The corollary of the assumption of duality is that of cor ad cor loquitur (like speaks to like). That is, there are kinds of knowledge corresponding to the aspects of reality. The phenomenal or familiar ego utilizes the tools of the senses and acquires knowledge concerning the material aspect. This knowledge is flawed and imperfect. The mind aspect however, can acquire knowledge concerning its corresponding sphere. Mind can know mind. Mystics believe that through utilizing faculties which partake of mind, the higher aspects of reality can be known.

DISCUSSION

It is immediately apparent that the major distinction between the sets of assumptions accounting for mystical experience lies in the question of authenticity. The psychological explanation denies authenticity and searches for an explanation which would account for the peculiar malady in which the delusion of enlightenment is accepted as genuine. The mystical model accepts the authenticity of the phenomenon and thus bases the explanation on the construction of a system which incorporates illumination as a source of knowledge.

It should be equally apparent that there is no empirical way of choosing between the competing assumptions. However, if we wish to understand the practice it would seem that we would wish to comprehend what it is that the mystics believe whether or not these beliefs are correct. There are people who believe in this possibility of whether or not it is possible to gain knowledge from contemplation. This belief influences their behavior. It is then this complex of beliefs which should concern us.

What then are these beliefs? Mystics clearly do not suggest that the only source of knowledge is contemplation. If one wished to acquire 'know how' or knowledge of a practical empirical nature mystics would recommend empirical methods based on information received from the senses. Their concern is with one particular sort of knowledge - one which is highly abstract; concerned with basic order, general principles. In the simplest terms, their assertion is that to acquire knowledge of 'mind', of abstract principles, basic order, one must be free from pre-occupations with the concrete and the immediate. When such a state of pure concentration is reached, this knowledge can be acquired. When stripped to essentials this position is no longer so perplexing.

We all commonly assume that thinking can best be done with a mind free from distractions. The mystics' program and assumptions appear then to be merely an extension of this familiar proposal. The only distinguishing feature of the mystics' assertion involves the issue of new knowledge. The common sense assumption here is that ideas are merely organized during periods of meditation; we remember things which had been forgotten, we possible attach new significance to old facts. We do not assume that new information is added during such a process. The mystic contends precisely this - during this special repose new information, new knowledge is acquired. It is not simply remembered or re-organized; it is acquired. This then is the distinguishing mark of the mystical assumptions.

III

DEFINITION OF MYSTICAL KNOWLEDGE

INTRODUCTION

The enterprise of mysticism is based on the belief that knowledge can be obtained from contemplation. The assumptions fundamental to the mystical theory of knowledge develop and support this view. These are, as has been shown, first that there is a truth which exists to be known; second, that proof of the existence of this truth is derived from our hunger for knowledge; third, that the senses alone are inadequate for the apprehension of this truth; and finally, that mind can know mind. This truth inaccessible to the senses can be apprehended by mind alone. It is clear therefore that while mystics do not necessarily practice the discipline of contemplation for the sole purpose of acquiring knowledge, cognitive components nevertheless form the central core of the venture. While factors such as ethical development, personal salvation, and worship may be important goals acquisitions of knowledge is the crucial goal.

Mystics claim that new knowledge of a non-trivial character is acquired in the course of contemplation. This knowledge is seen as being special and unique to the practice. Mystics do not generally claim that one can learn to build bridges through contemplation, that is, empirical technical knowledge is not their aim.

The character of the knowledge claimed by mystics will be discussed in this chapter. Briefly, they claim that mystical knowledge comes from experience; that it is knowledge of a "third" kind; that it is synthetic rather than analytic.

CRITERIA OF MYSTICAL KNOWLEDGE

The mystics believe that knowledge is acquired as the direct result of experience. Such a belief is hardly unusual or radical. We all believe that experience is one method by which learning occurs. The commonplace notion of experiential learning however, does differ in fundamental ways from the mystical conception. When we ordinarily speak of learning from experience we mean a sort of trial and error process whereby one learns to associate appropriate procedures with desired results. No such notion is part of the mystics' view except in the limited sense of acquiring technical facility. The mystics believe that an experience of a particular kind confers knowledge which is a direct departure from established procedures, opinions, and theories. In other words, the commonplace conception sees the kind of knowledge derived from experience as being primarily of a "know-how" variety. It involves the refinement of available knowledge and not a radical departure from it. While trial and error is clearly necessary to the development of the mystics' method, the knowledge gained through the use of the method is perceived as a radical and definitive departure from all knowledge previously held. One has the experience and as a result acquires a totally transforming sort of knowledge. The character of this aspect is evident in the following depiction of a mystical experience, the subject of which is Dr. R.M. Bucke, a psychologist.

> ...Directly afterwards there came upon me a sense of exultation, of immense joyousness, accompanied or immediately followed by an intellectual illumination quite impossible to describe. Among other things, I did not merely come to believe, I saw that the universe is not composed of dead matter, but is, on the contrary, a living Presence; I became conscious in myself of eternal life. It was not a conviction that I would have eternal life, but a consciousness that I possessed eternal life then; I saw that all men are immortal; that the cosmic order is such that without any peradventure all things work together for the good of each and all; that the foundation principle of the world, of all the worlds, is what we call love, and that the happiness of each and all is in the long run certain. The vision lasted a few seconds and was gone; but the memory of it and the sense of the reality of it has remained during the quarter of a century which has since elapsed. I knew that what the vision showed was true. I had attained to a point of view from which I saw that is must be true. That view, that conviction, I may say that consciousness, has never, even during the periods of the deepest depression, been lost.
>
> (Happold, 1963:136)

Krishna, describing the aim of Yoga, expresses similar thoughts:

> True enlightenment consists of reaching beyond the highest intellects of the time to grasp and proclaim the Law. There is no uncertainty and vacillation, because the truly enlightened one is as sure of his perception of the higher truths revealed to him as he is of the existence of the physical world seen with mortal eyes.
>
> (Krishna:16)

Knowledge is generally considered to be of two basic sorts; either sensory - that is, derived from sense perceptions; or inferential, derived from reason. These two sources, alone or in conjunction, are usually considered to be exhaustive. The kind of knowledge gained through the mystical experience however, is asserted by mystics to be of a third variety. As Meister Eckhardt states, there are:

> ...three kinds of knowledge. The one is sensible: the eye sees at a far distance the things that are outside it. The second is rational and is much higher. By the third is understood a noble power of the soul, which is so high and so noble that it grasps God in His own pure

> Being. This power has nothing in common with anything else...
>
> (Ancelet - Hustache:109)

Not only then is this third sort of knowledge thought to represent a new source of illumination; it is considered by mystics to be of a higher, more perfect sort, far superior to logic and sensation. Thus, in accord with the basic assumptions of the practice, this third kind of knowledge more completely partakes of 'mind'. This kind of knowledge, inadequately called intuitive, consists in a direct apprehension of truth. The mystic acquires knowledge through contact with the thing known. Saint John of the Cross describes the process in the following manner:

> This knowledge consists in a certain contact of the soul with the Divinity, and it is God Himself Who is then felt and tasted, though not manifestly and distinctly, as it will be in glory. But this touch of knowledge and of sweetness is so deep and so profound that it penetrates into the inmost substance of the soul. This knowledge savours in some measure of the divine Essence and of everlasting life.
>
> (Butler, 1967:10)

The knowledge is said to be above logic or at least to be non-logical.

> The statements and generalizations refer to a level of cognition or experience, where, to believe them, opposites are reconciled and logic as we know it ceases to function, at least ceases to dominate discourse.
>
> (Ghose, 1968:30)

> If we really wish to get to the bottom of life, we must abandon our cherished syllogisms, we must require a new way of observation whereby we can escape the tyranny of logic and the one-sidedness of our everyday phraseology.
>
> (Suzuki, 1964:58)

The mystics believe that logic is a constructed artifice. They feel that the universe does not run according to our logic. The universe simply is; it exists and nothing more. Our constructed logic does not encompass it. Non-mystics, they believe, do not grasp this essential fact and therefore attempt to force their rules, concepts, and laws onto the universe in order to better describe and understand its working.[1] Mystics, on the other hand, claim that in order to comprehend the world as it is we must learn to transcend our logic. Their experiences, in other words, attempt to avoid the reification of logic. Since this is their aim and because their knowledge is inexpressible in terms of any conventional logic, their knowledge is said to be without logic.

Mystical knowledge is said to be above concepts and images, an example of "pure" knowing or perception.

> ...the intelligence can know truths supernaturally without the medium of any sense image and without any conception.
>
> (Merton, 1951:263)

The senses and intellect are imperfect. Mystics believe that they cannot provide a measure of absolute Reality. However, since man's spiritual faculty partakes directly of this reality it can provide such a measure if unencumbered. Dionysius the Areopagite, a principal founder of the Christian tradition of mysticism, stated this principle as follows:

> Do thou, then, in the intent practice of mystic contemplation, leave behind the senses and the operations of the intellect, and all things that the senses or the intellect can perceive, and all things which are not and things which are, and strain upwards...
>
> (Johnston, 1973:26)

Finally, the experience is not achieved in terms of the perceptions as commonly understood since none of the conventional sensory equipment is involved. The state is very difficult to describe except in negations. Nicholas of Cusa attempts to depict what is intended:

> ...the marvels of revelation, which are beyond all sight of our eyes, our reason and our understanding.
>
> (1928:2)

> ...there where speech, sight, hearing, taste, touch, reason, knowledge, and understanding are the same, and where seeing is one with being seen, and hearing with being heard, and tasting with being tasted, and touching with being touched, and speaking with hearing, and creating with speaking.
>
> (1928:46)

It must be remembered that while the mystics attempt to convey their experiences in terms of visions and auditions, this is not generally intended to express literally the content of the experience. Rather, it should be seen as an attempt to translate the experience into something recognizable in conventional terms.

The mystical experience is seen as conveying knowledge of a definitive or authoritative variety. The mystics view this illumination as being knowledge which fulfills strict epistemological requirements: truth, belief, and sufficiency of evidence. This knowledge, as we have seen, can be characterized as intuitive. It is non-logical: it cannot be expressed in terms of conventional logic, nor does it "obey" the rules of any conventional logical. It is non-sensory and non-conceptual by which is meant that the mystic does not experience the illumination in either conceptual or sensory form. [Dunlap suggests that the knowledge is experienced as a feeling or in the manner of an emotion (1929:38)].

COMMUNICATION

One fairly obvious problem with this kind of knowledge involves communication. Because humans do not have (at least at present) highly developed telepathic powers, if knowledge is to be shared it must be through the vehicle of language. Attempts to share mystical knowledge therefore must employ sensory images and concepts. Conventional language lacks the qualities necessary for scientific communication. Science therefore developed its own language which embodied the necessary precision. Similarly, the conventional language does not have the requisite qualities which would convey the content of a mystical experience. A symbolic language has been utilized in order to convey, at least indirectly, the richness and the substance of the mystical experience. A symbolic language is also most appropriate given the non-logical, non-linear character of the mystical knowledge.

Three principal forms of symbolism have been employed:

1. Mystic Quest
   Those who conceive the Perfect as a beatific vision exterior to them and very far off, who find in the doctrine of Emanations something which answers their inward experience will feel the process of their entrance into reality to be a quest, an arduous journey from the material to the spiritual world.

2. The Marriage
   Those for whom mysticism is above all things an intimate and personal relation, the satisfaction of a deep desire...will fall back upon imagery drawn largely from the language of earthly passion.

3. Transmutation - The Great Work
   Those who are conscious rather of the Divine as a Transcendent Life immanent in the world and the self, and of a strange spiritual seed within them by whose

> development man, moving to higher levels of character and consciousness, attains his end, will see the mystic life as involving inward change rather than out-going search.
>
> (Underhill, 1970:128)

The problem with such a symbolic language is its vagueness. It is difficult to express thoughts precisely and with certainty in such terms. What is conveyed is the mystic's deep sense of emotion concerning the experience and the intense conviction involved. The content of the experience remains obscure. For this reason mystics claim that in order to truly appreciate or understand one must share the experience. The non-practitioner can only accept on authority that the experience is illuminative.

One indirect source of evidence linking mysticism with the acquisition of communicable knowledge is the independent scholarship of mystics. Unfortunately, the extent to which the mystical experience determines the content of other intellectual endeavours is uncertain. For example, Saint Augustine was a mystic. His writings however, do not indicate the extent to which his mystical illumination determined or influenced the content of his theological and philosophical writings. We do not know, for example, if the theme of the City of God was "revealed" or "discovered" or otherwise acquired in the course of contemplation. Therefore, while there have been a number of very powerful scholars who were mystics, it is not clear to what extent their scholarship is attributable to their mystical activities. We do not know to what extent mysticism represents anything useful to other intellectual activity. We also do not know to what extent mysticism represents "new" knowledge or insight. The mystics are unclear as to whether the experience constitutes proof of present conviction or the source of new convictions.

CONCLUSION

The mystics accept intuition of a certain specialized sort as knowledge. That is, they regard their insights acquired during contemplation as true and sufficiently warranted. This knowledge comes from a direct, non-intellectual, non-sensory contact with Reality. This Reality is thought to be 'mind' or spirit apprehensible only with that corresponding faculty in man.

For the mystics the only problematic issue in this area is communication.[2] The substance of their knowledge is trapped within them because of the incapacity of language to accommodate to the fluid nature of their illuminations. Their solution involves the use of a highly symbolic 'poetic' expression and the use of negation and paradox.

At this point difficulties from the mystics' point of view cease. Their epistemology neatly accommodates the illuminations as knowledge. They do not make any conspicuous attempt to harness this knowledge to any discussion of the material world. They frame no laws relating to matter, in general make no analytic statements. The only possible exception to this could be the case in which mystical knowledge is used as a basis for other scholarly endeavours; however, as stated earlier, this practice is neither noted nor recorded. It remains a large area of ambiguity. In general the mystic appears content with the mere acquisition of certainty. He or she derives comfort from this discovery. Refreshed and rejuvenated the mystic basks in the bliss of 'appreciation' and is satisfied.

For those not blessed with mystical illumination, the epistemological problems are more complex. First, it is uncertain whether the mystical experience confers anything more than simple belief. It is not clear whether such 'knowledge' is true or warranted sufficiently so as to justify belief. Second, if mystical knowledge is granted the status of more than simple belief, it still remains to be seen to what extent such knowledge represents a departure from or an addition to existing knowledge. Does it, in other words, simplify in any way the knowledge already possessed by the mystic? Third, there is the problem of differentiating between genuine mystical knowledge and delusion.

All these problems revolve around the inaccessibility of the mystical revelation. The mystical system itself incorporates some techniques of verification in answer to this problem. However, so long as the knowledge remains purely of a private variety inaccessible to public scrutiny, the problems would seem to be insoluble. One is left with no options other than acceptance on authority or outright rejection. The occult system, as we shall see, while continuing to make use of a similar variety of knowledge as an integral source of new input, attempts to resolve some of these difficulties. Science similarly has attempted to provide a link between intuitive knowledge and sensory and inferential knowledge, thereby becoming the basis for a series of laws governing relationships both physical and non-physical; a tool for the precise description and analysis of the universe.

FOOTNOTES

[1] In this they voice sentiments similar to those used by ethnomethodologists in describing conventional sociology.

[2] I believe this to be problematic only for some. Many mystics, some of the most prominent, demonstrated great reluctance in attempting to communicate their relevations. Saint Teresa of Avila, for example, did so only under direct order of her spiritual directors, and then only with reservations. In view of the above, it is probable that a good number of mystics do not make any attempt to communicate their insights either because they feel that communication is inherently impossible or because they see no reason to make an attempt.

IV

METHODOLOGY OF MYSTICISM

INTRODUCTION

The transforming and transcendent knowledge which mystics seek is thought to be acquired during contemplation. Contemplation requires the maintenance of a special kind of concentration, a particular state of consciousness. This state of consciousness differs from ordinary waking consciousness. In particular, attaining this state seems to require a shift in attention on the part of the practitioner such that the usual perception of the self and the environment are eradicated. Ordinary thought processes, the stream of consciousness, must be stalled.

To this end the methodology of mysticism directs effort at manipulation not of the environment, but of the self. Where science for example strives to increase scrutiny of the material world, mysticism demands that all such scrutiny be eliminated. Where magic requires a systematic cultivation of the will, mysticism stipulates that the will must be ignored and forgotten.

Various branches of mysticism differ somewhat in the precise direction and content of method. Nevertheless investigation reveals that several stages of method are common to all of the traditions.

It is these basic stages which will be presented in this chapter. They are: the awakening, detachment, self abandonment, and contemplation. In addition we will elaborate upon the question of verification in mysticism. As we have seen in the previous chapters, the private nature of the mystical experience and the elusive character of the knowledge imparted by this experience create a major problem in assessment. If anyone other than the mystic wishes to judge the validity of the mystic's claims, some standards must be available to aid in adjudication. The standards most frequently evoked in mysticism are: perfection of method, natural reason, and authority. The relative success of such criteria in solving the problem of verification will be considered at the conclusion of this chapter.

AWAKENING

Given that the entire focus of mysticism is the self, it is not surprising that the methodology of mysticism is geared to the manipulation not of the external world, but of the internal world of the self. The first step in the method is usually not a conscious or deliberate step on the part of the practitioner. The "accidental" nature of this initial "awakening" could well account for the persistent belief on the part of practitioners that one is "called" to a contemplative life. The initiation involves a spontaneous and unsolicited mystical experience. Such an experience, which Zaehner (1957) has termed natural mysticism, issues from a variety of sources. It could arise from the ingestion of drugs, as was the case with Huxley (1963); alternatively, it could be the result of insanity or a wide variety of physical causes, or it could simply "happen", without apparent cause.

The initial experience of Boehme, a famous mystic of the sixteenth century, is illustrative of this point. He was a shoemaker, poor and uneducated, who had given no signs of mystic inclination until his sunroot experience which, he claims, was triggered by staring into sunlight reflected in a pewter dish (Boehme; ix). At this time he fell into a trance and recorded the following sensations:

> In a quarter of an hour I observed and knew more than if I had attended a university for many years. I recognized the Beings of Beings, both the Byss and the Abyss, the eternal generation of the Trinity, the origin and creation of this world and of all creatures through the Divine Wisdom. I saw all three worlds in myself: first the Divine World; second, the dark world and the source of fire; third, the external, visible world as an out-breathing of the inner or spiritual world. I also saw the fundamental nature of evil and good, and how the pregnant Mother, the eternal genetrix, brought them forth. My experience is like the evoking of life in the presence of death, or like the resurrection from the dead. My spirit suddenly saw all created things, even the herbs and grass, in this light...
>
> (Steiner, 1960:72)

This statement is significant for a number of reasons. First, it indicates how, even in this initial experience, characteristic terms of mysticism are present; for example, the notion of recognition, and the division of worlds into spiritual and visual. Second, it indicates in a dramatic fashion the all encompassing nature of the experience. Boehme felt transformed and in some sense was transformed. Finally, there is conveyed the feeling of arrogance which frequently appears to accompany the first experience. In persons who do not persist in mysticism this arrogance takes the form of an assumption that knowledge has been conveyed intact: there is no more to be gained. Huxley represents one extreme of this position in his claim that his mescaline induced root experience was the same as that of the advanced contemplatives (Zaehner, 1957:18). Those who pursue mysticism do not share this feeling but define the first experience as merely an incomplete foreshadowing of the enlightenment to follow. It would seem that on this point the argument of the more experienced is to be accepted. Having sampled the fruits of both spontaneous and disciplined contemplation, they seem in a better position to assess the comparative quality of the experiences than the person who has experienced only the spontaneous form.

Regarding the spontaneous experience, it should be noted that its form is constant. This basic similarity characterizes both the initial mystical experience of those who proceed with further mystical exploration and for those who do no subsequent exploration. By way of illustration, here is reproduced the description of one such experience. The subject was a young school boy, who did not pursue his experience.

> ...transforming the world around me into a kind of tent of concentrated and enhanced significance. What had been merely an outside became an inside. The objective was somehow transformed into a completely subjective fact which was experienced as 'mine', but on a level where the word had no meaning; for 'I' was no longer the familiar ego.
>
> (Happold, 1963:129)

To conclude, the first part of the method of mysticism simply occurs. It is not usually the result of a deliberate choice. The stage, which can be called awakening involves the subject in an experience of spontaneous or natural mysticism. The common characteristics of such a state include: heightened sense of color; distorted sense of spatial and temporal relationships; heightened sense of reality and significance; distorted or unusual sense of self. The most cogent description of such experiences and their significance is provided by Thomas Merton, quoted below:

> Our ordinary waking life is a bare existence in which, most of the time, we seem to be absent from ourselves and from reality because we are involved in the vain pre-occupations which dog the step of every living man. But there are times when we seem suddenly to awake and discover the full meaning of our present reality. Such discoveries are not capable of being contained in formulas or definitions. They are a matter of personal experience, or uncommunicable intuition. In the light of such an experience it is easy to see the futility of all the trifles that occupy our minds...
>
> (1951:10)

DETACHMENT

The second stage in the method involves a detachment from material things. These material things represent one important aspect of the pre-occupations mentioned by Merton. Mystics believe that so long as the practitioner is attached to material things, he can never attain a true state of contemplation. Thus the true object of the practice is mental. It is not the act of renunciation itself which is the goal, but rather the mental freedom which is presumed to be the consequence of the act. In other words it is thought that it is possible to renounce material possessions but still fail to master this stage of the method. If one is still preoccupied with thoughts of material things after a physical renunciation of these things, true detachment has not yet been attained. It would also be possible to maintain physical possession of material things while being mentally free from attachment to them. In general, however, this is thought to be too difficult a course to master. The essence of this stage is stated in The Book of the Poor in Spirit, a fourteenth century text:

> A contemplative life is elevated above all that is temporal and is an enjoyment of eternal things only. He, then, who desires to lead such a life must necessarily depart from all that is temporal... detaches himself from all creatures so that no one can speak good or ill of him.
>
> (Kelley, 1954:182)

And again the same theme is echoed by Saint John of the Cross:

> In order to arrive at having pleasure in everything,
> Desire to have pleasure in nothing.
> In order to arrive at possessing everything,
> Desire to possess nothing.
>
> (Happold, 1963:59)

The actual form of material renunciation varies. It quite clearly includes the rejection of attachments to persons as well as to objects. This is clearly stated in The Cloud of Unknowing, an anonymous mystical text of the fourteenth century:

> You are to concern yourself with no creature whether material or spiritual nor with their situation and doings whether good or ill. To put it briefly, during this work you must abandon them all beneath the cloud of unknowing.
>
> emphasis in original
>
> (Johnston, 1973:53)

The notion of the sacred journey or pilgrimage was an important early manifestation of renunciation.

> The geographical pilgrimage is the symbolic acting out of an inner journey. The inner journey is the interpolation of the meanings and signs of the outer pilgrimage. One can have one without the other. It is best to have both.
>
> (Merton, 1967:92)

Saint Helena and Saint Gregory of Nyssa were among the first to undertake this approach in the Christian tradition.

Peregrinato or "going forth into strange countries" was a similar early method of detachment - one especially favored by the Irish. This method involved the undertaking of journeys alone, with neither provision nor destination; often in boats which were allowed to drift unguided in the currents. The third principal form of detachment employed in the West involves a group solution - that of the monastery. Members of monastic orders renounce all title to individual ownership of possessions in their vow of poverty. In this manner their lives are made more secure and their contemplation is rendered of a more permanent settled nature while still allowing for the requirement of detachment.

Eastern mystics have employed all three of the above mentioned methods, frequently in combination. Monasteries allowing for the contemplative life were a feature of pre-communist Tibet before it fell to the communists (David-Neel, 1971). Such monasteries are also of great significance in Zen Buddhism (Suzuki, 1965). Tibet was known for large numbers of pilgrim mystics, dependent for sustenance on providence as well as for the hermit mystics living in isolated caves in the Himalayas following perhaps the most extreme form of physical renunciation.

In summary, the stage of detachment demands that the subject renounce attachments to all material things, both animate and inanimate. This stage is intended to free the mind from the "vain pre-occupations" of which Merton speaks. It must be remembered as with everything in mysticism, it is the mind that is the question here, not material things per se. Finally, such a dramatic discipline, awesome as it seems to be, is only the first, and in fact, the easiest step. It is followed by the renunciation of the self.

SELF ABANDONMENT

> They have had an experience so overwhelming, so out of proportion to the rest of things, that they were freed from all petty hinderances which prevent the normal man from carrying out his projects.
>
> Worrying about clothes, food, money, what people may think, how and why and above all the fear of consequences, clog nearly every one...
>
> The most important factor, is however, the annihilation of the Ego.
>
> emphasis in original
>
> (Crowley, 1973:30)

> And now also you must learn to forget not only every creature and its deeds but yourself as well, along with whatever you may have accomplished in God's service.
>
> (Johnston, 1973:102)

Detachment, as we have seen, frees the mind from material concerns. The practitioner must now attempt to free his mind from consciousness of self. It must be remembered that one of the key assumptions of mysticism is that of the dual self. Self abandonment attempts to free the mind from thoughts of the familiar self - the ego. As Merton states, the self must be divested of the I,[1] (1967:224). There are several aspects to this procedure. Mortification, an extreme form of self discipline, disrupts the old habits and preferences of the self.

> The object of mortification is to kill that old self, break up his egoistic attachments and cravings, in order that the highest center; the 'new man' may live and breathe.
>
> (Underhill, 1970:217)

The process does not endure. It is to be abandoned when the subject has destroyed consciousness of the old habits and replaced them with consciousness of the new 'spiritual' pattern. Suso, for example, practised ascetic disciplines of the most rigorous sort, including the wearing of hair shirts, of night shirts with nails inside, and the practise of having nails driven into his back. After sixteen years of this procedure he received a vision "allowing" him to terminate his mortifications.

Accompanying mortification is the cultivation of virtue which this can be viewed as a shift in the habits of the self designed to promote mental calm.

> ...to live so that no emotion or passion disturbs the mind.
>
> (Crowley, 1974:20)

> Let men look upon virtue, then, in this way: he who desires perfect virtue should abandon himself to virtue until he is spiritually poor in all creatures and possessions, and until no one requests anything further of him.
>
> (Kelley, 1954:173)

In addition to this 'shift in self', the subject must learn to 'lose the self' for periods of time in order for contemplation to be possible. Christian mystics have tended to emphasize the mortification stage and to employ prayer and desire to this end. It is in the technique of the Eastern mystics that special procedures for this stage of self abandonment are truly refined. Crowley (1974) provides a summary of several of these disciplines.

Asana

This discipline involves control of the body through maintenance of a single posture for long periods of time. Four postures are recommended.

> The God - Sit in a chair; head up, back straight, knees together, hands on knees, eyes closed.
> The Dragon - Kneel, buttocks resting on the heels, toes turned back, band and head straight, hands on thighs.
> The Ibis - Stand, hold left ankle with right hand, forefinger on lips.
> The Thunderbolt - Sit, left heel pressing up anus, right foot poised on its toes, the feet covering the phallus; arms stretched out over knees; head and back straight.
>
> (1974:443-444)

This discipline must be practised daily, for increasing periods of time. It can be considered perfected when a posture is held for at least an hour without any movement on the part of the subject and without the subject being conscious of any discomfort.

> ...a saucer filled up to the brim with water and poised upon the head does not spill one drop during a whole hour, and when you can no longer perceive the slightest tremor in any muscle; when in short, you are perfectly steady and easy...
>
> (1974:444)

Pranayama

This discipline involves the control of breathing. The breathing is to be made 'slow, deep and regular' in order to "still consciousness of all the functions of the body". (1974:15) The method is as follows:

While in Asana:

> Close the right nostril with the thumb of the right hand, breathe out slowly and completely through the left nostril, while your watch marks 20 seconds. Breathe in through the same nostril for 10 seconds. Changing hands, repeat with the other nostril...
>
> (1974:444)

The practice can be said to be perfected when the interval is at least 20, 10, 30, (out, in, hold) and when the discipline in unconscious, i.e., not deliberate or forced in any way.

Mantrayoga

This exercise is a form of meditation. While practising posture and breath control, a rhythmic chanting of a simple phrase is undertaken. The point is to keep the mind occupied with the phrase or mantra and not to allow extraneous thoughts to intrude. In Crowley's words:

> ...thought bound to a recurring cycle... Utter it (mantra) as loudly and slowly as possible ten times, then not quite so loudly and a very little faster ten times more. Continue this process until there is nothing but a rapid movement of the lips; this movement should be continued with increased velocity and diminishing intensity until the mental muttering completely absorbs the physical.
>
> (1974:15)

Pratyhara and Dharana

These practices represent two further stages in mind control. The first involves the attempt to "acquire some sort of inhibitory power over thoughts" (1974:24). Several exercises are suggested to aid in the development of this skill. The subject is advised to avoid using some common word in his speech, some letter in the alphabet, some pronoun. A record is to be kept of progress. In this manner the 'unconscious' habits of speech are brought under control (1974:491). The second exercise is to avoid some common physical gesture such as raising an arm or crossing the legs for a period of time until vigilance in such physical matters is a matter of course (1974:492). Finally, some common thought or subject is to be similarly avoided until "perfect vigilance" can be exerted over thought as well as speech and gesture (1974:493).

The second practice in mind control, Dharana, involves the attempt to 'focus' all of the mind on a single thought or object (1974:25). When the discipline is perfected the subject will "completely forget who you are, what you are and what you are doing" (1974:27). When this state is reached the subject will have reached the point where self abandonment is attainable intentionally by the practitioner. This is the most difficult stage and many breaks in concentration are experienced. Among these are:

a) physical sensations,
b) consciousness of events,
c) day-dreaming,
d) consciousness of participation ('how well I'm getting on'),
e) hallucination.

(1974:27)

The process of self abandonment has been shown to consist of two principal steps. First, the subject must learn to forget his familiar material self and its habits and pleasures in order that the spiritual self may be free. Second, the mind must be brought under control so that it is freed from pre-occupation with the self, with physical sensation, and with concepts and thoughts. This is particularly crucial since mystical experience does not involve either conceptual or inferential thought. Since these generally dominate the mind, great effort must be exerted in order to break the mind free from their grasp. When this stage has been perfected true contemplation can occur.

CONTEMPLATION

> ...In order to arrive at knowing everything
> Desire to know nothing.

for

> When the mind dwells on anything,
> Thou art ceasing to cast thyself upon the All
> For, in order to pass from the all to the All
> Thou must deny thyself wholly in all.

Saint John of the Cross

(Happold, 1963:59)

Mystics believe that illumination or intuitive knowledge is obtained thorugh the mystical experience. The preceding stages of the method are concerned with the preparation of the subject. When he has perfected these stages he can enter into a state of true contemplation. Contemplation is characterized by a withdrawl of attention from the phenomenal world and an extreme form of concentration. The premier distinguishing feature of the contemplative experience is the perception of merging or unity. The self is seen as indistinct from what is known.

> ...this consciousness of the Ego
> and non-Ego, the seer and the
> thing seen, the knower and the
> thing known is blotted out...

(Crowley, 1974:9)

A fourteenth century Zen Master:

> When your questioning goes deeper and deeper you will get no answer until finally you reach a cul-de-sac, your thinking totally checked. You won't find anything within that can be called "i" or "mind". But who is it that understands all this? Continue to probe more deeply yet and the mind that perceives there is nothing will vanish; you will no longer be aware of questioning but only of emptiness. When awareness of even emptiness disappears, you will realize that there is no Buddha outside Mind and no Mind outside Buddha. Now for the first time you will discover that when you do not hear with your ears you are truly hearing and when you do not see with your eyes you are really seeing Buddhas in the past, present, and future.
>
> (Merton, 1967:236)

> The aim of yoga, then is to achieve the state of unity or oneness with God, Brahman, spiritual beings such as Christ and Krishna, Universal Consciousness, Atman or Divinity...
>
> (Khrisna; 13)

These statements representative of three of the major traditions within mysticism reinforce the unitive character of contemplation. It is this sense of union which distinguishes contemplation from experiences of natural mysticism. In natural mysticism, the self is dislocated but union not achieved: the subject still remains at a distance from the object of contemplation.

Other principal features of the contemplative state are enumerated below.

The first such feature is the ineffable transcendent nature of the state. Nicholas of Cusa attempts to depict this aspect of the state in the following description:

> ...there where speech, sight, hearing, taste, touch, reason, knowledge, and understanding are the same, and where seeing is one with being seen, and hearing with being heard, and tasting with being tasted, and touching with being touched and speaking with hearing, and creating with speaking.
>
> (1928:46)

Second, it is conceived of as being neither empirical nor intellectual. Since the senses and conceptual thought are imperfect, they must be abandoned if perfection is to be attained. As Dionysius the Areopagite states:

> Do thou, then, in the intent practice of mystic contemplation, leave behind the senses and the operations of the intellect and all things that the senses or the intellect can perceive, and all things which are not and things which are, and strain upwards in unknowing, as far as may be towards unknowing, as far as may be towards the union with Him Who is above all things and knowledge.
>
> (Williams, 1973:26)

Third, the experience is seen as given. The subject can make himself receptive to enter into the state but this does not ensure that illumination will be the result. As Thomas Merton states:

> Mysticism is a gift of God. It cannot be acquired by any ascetic technique. It cannot be merited (*de condigno*) in any strict sense by any man, however holy he may be. No system of meditations, of interior disciplines, of self-emptying, of recollection and absorption can bring a man to union with God, without a free gift on the part of God Himself. Still less can a man arrive at mystical union with God by an effort of the intellect on his natural level. Mystical wisdom cannot be produced by study...
>
> (1967:76)

Finally, the experience carries for the subject a feeling of absolute certainty. Whatever the non-practitioner may think of the experience, the mystic carries the conviction that he has been given knowledge, and that this knowledge represents at least a taste of absolute truth.

> True enlightenment consists of reaching beyond the highest intellects of the time to grasp and proclaim the Law. There is no uncertainty and vascillation, because the truly enlightened one is as sure of his perception of the higher truths revealed to him as he is of the existence of the physical world seen with mortal eyes.
>
> (Khrishna:16)

This sense of certainty provides for the individual mystic at least, all the verification of the authenticity of the experience required. There remains a problem of public verification. To this end several procedures aimed at verification of the authenticity of the experience have been evolved.

VERIFICATION

Granting acceptance of the premise that knowledge can be acquired through mysticism, it still remains necessary to separate the instances of genuine illumination from those of delusion and fraud. This aspect of verification then concerns the scrutiny of particular mystics and their utterances rather than a scrutiny of the phenomenon as a class. Since the knowledge itself is incommunicable, intimately associated as it is with a state of being or consciousness, it cannot be examined directly. What is subject to scrutiny are the methods employed and the translations or attempts to verbalize the knowledge. The mystics, in conjunction with their directors and counsellors, are examined according to several strategies of verification. First, the subject is instructed in the multiple "fallacies" or misapplications of the method. Second, the subject is instructed to follow the counsels of natural reason and his spiritual director. Third, the outcome is ultimately scrutinized according to its compatibility with existing intellectual tradition. This is usually the theological tradition and dogma of the particular time and faith of the subject.

FALLACIES

The fallacies of the method involve,in general, an over emphasis on a particular phase of training. The fallacy consists in confusing means and end: the practitioner mistakes process for product. The Zen Master Hui Ning states this quite clearly:

> If you cherish the notion of purity and cling to it, you turn purity into falsehood... Purity has neither form nor shape, and when you claim an achievement by establishing a form to be known as purity...you are purity bound.
>
> (Merton, 1967:221)

And from the Zen Master Shen Hui:

> If disciplines cultivate (a state of) unreality and stay put in unreality, then they are chained in unreality. If they cultivate contemplation and stay put in it, the very contemplation enchains them; when they cultivate the silence of the beyond and stay put in it; the very silence of the beyond enchains them.
>
> (Merton, 1967:221)

European mystics have developed a body of thought centering on the concept of fallacies stemming from the stages of mystic training.

Two fallacies are associated with the mortification state of training. The first, angelism, involves the assumption that man is essentially pure spirit. The subject therefore attempts to annihilate the body to release the true self. This strategy results in a brutalization of the subject and his experience and is not thought to lead to genuine illumination. As Pascal states: Qui vent faire l'ange, fait la bête.

(Merton, 1951:119)

The second fallacy is that of the avidity for exterior mortification. The danger is that one becomes involved in mortification for itself as an end or as a source of pleasure either sensual or prideful. Saint John of the Cross was particularly scornful of those who fall prey to this deviation.

> These persons are most imperfect and devoid of reason, for they set bodily penance before subjection and obedience, which is a penance of reason and discretion, and, therefore a sacrifice more pleasing to God than any beside. (Their attachment to bodily penance) is no more than the penance of beasts, to which they are attracted, exactly like beasts, by the pleasure and desire which they find therein.

(Merton, 1951:176)

The stage of meditation is subject to the fallacy of quietism. This error, considered a serious heresy as well as technical error, occurs when the subject attempts only to block out all thoughts and images finding this peace the desired end. Quietism is an error of laziness. It represents passivity carried to an extreme.

> ...the self has nothing more to do but to rest in the Divine Life, be its unresisting instrument. Pure passivity and indifference was its ideal. All activity was forbidden it; all choice was a negation of its surrender, all striving was

> unnecessary and wrong. It needed only to rest for evermore...
>
> (Underhill, 1970:325)

This of course violates the active striving quality of mysticism.

Finally, even advanced contemplatives can fall victim to the fallacy of delusion. This is simply mistaking a false vision for true illumination. It is variously described as the belief in hallucinations or as the acceptance of demonic visions as divine. This fallacy can only be rectified through the reliance on other verification procedures; namely, natural reason, spiritual counselling, and formal theology.

NATURAL REASON

While the intellect pays no active part in contemplation as such, its role is important in verification. The mystic is instructed to employ his natural reason to evaluate his experience after the Fact. As Merton states:

> Reason, acting in the service of faith, must question and evaluate and pass judgment on all our most intimate and spiritual aspirations. It must examine, with merciless objectivity, everything that presents itself to us as a supernatural impulsion. It must question every interior voice. It must plunge our purest 'lights' into the dark sea of faith. The great paradox of Saint John of the Cross is that his ascetisism of 'night' cannot possibly be practiced without the light of reason.
>
> (1951:155)

The fundamental paradox of mysticism begins to emerge at just this point. The mystic carries away from his experience a sense of conviction. He is certain that he has been enlightened. Further, he believes that his experience is above reason; inaccessible to the intellect. How then is he to expose this experience to the ex post facto scrutiny of reason? How could he possibly be objective in the examination of such an experience? Further if the illumination does indeed represent a genuine departure, there can be no assurance that natural reason, so called, is equipped to perform an evaluation. Natural reason after all, told us that heavy bodies fall faster than light. The answer of the mystical tradition, when certitude is considered to be insufficient, is to rely on the scrutiny of someone other than the mystic for verification.

SPIRITUAL DIRECTOR

> Actually, whenever the contemplative life is taken seriously, the first thing required of the novice is the willingness to submit to a master, to obey, to renounce his own judgment, to practice humility and to learn a doctrine of the interior life from a spiritual master.
>
> (Merton, 1951:147)

> It is preferable for the contemplative to be guided by the Holy Ghost through the Church and her Ministers than for him to follow the light of extra-ordinary and completely private experiences. To be more exact: his willingness to submit to the guidance of a qualified spiritual master will give evidence that his personal and interior aspirations...really come from God.
>
> (Merton, 1951:151)

This represents the conviction of the "establishment" of most major faiths from which mystics are drawn. From each tradition we find the spiritual director, the Zen master, the master-apprentice relationship of the Tibetans. From the point of view of the religious establishment the practice of mysticism is full of potential for error in the form of heresy or apostasy. Erring mystics have been known to lead others into error. It therefore is the safest course to maintain control by subjecting the mystic to guidance. Again, however, the paradox emerges. If the mystical experience is inaccessible to the scrutiny of natural reason; it appears to be even less accessible to scrutiny by some one other than the mystic himself. The extremely personal nature of the experience mitigates against the success of authentic verification by the spiritual director. This leaves only one avenue, that of recourse to established theological tradition.

THEOLOGICAL FRAMEWORK

> Tradition runs side by side with experience, the past collaberates with the present... man cannot safely divorce his personal history from that of the race. The best and truest experience does not come to the eccentric and individual pilgrim whose intuitions are his only law, but rather to him who is willing to profit by the culture of the spiritual society in which he finds himself, and submit personal intuition to the guidance afforded by the general history of the mystic type. Those who refuse this guidance expose themselves to...heresy...madness.
>
> (Underhill, 1970:300)

The influence of theological framework operates on a number of levels. First, it serves to provide a model for the expression of mystical thought. Common symbols, images and modes of expression derived from the basic theological framework unite mystics from a given tradition. In this sense the framework serves as a language through which mystics can attempt to convey the substance of their experience to others. It is a bridge from the mystic to the rest of society.

The framework provides a basis for evaluation of mystics. That is, mystics whose experiences are not in accord with the tradition will be discredited. Even very prominent mystics such as Meister Eckhardt have been subjected to this form of scrutiny and brought into check by it. This, however, presents the dilemma of mysticism in its final form. Mystics are credited with having access to knowledge. This is a matter of faith. One can accept it or not at face value: it cannot be proven. Knowledge must somehow be assessed and evaluated since not all mystics are genuine. Unfortunately, the only external means available for the assessing the credibility of the mystics are those based on tradition - on pre-existing knowledge and belief. A mystic who departs from a tradition will be considered heretical or mad. He will lack an audience and a language.

The knowledge of mysticism can be enlightening for the practitioner. It can bring peace, fulfillment, intellectual stimulation for those to whom it is given. The knowledge can serve a social function insofar as it inspires faith and devotion. It cannot however, due to the constraining function of verification, be of value in increasing the pool of socially accessible knowledge. If the mystic has a fund of knowledge it remains private and inaccessible to all but the practitioner.

On the other hand, it is clear that experiences and convictions which are entirely personal and remote from social utility have consistently been distrusted and dismissed. There are numerous sound reasons for this. The strength and continuity of the social bond would appear to demand it: logic certainly does. Similarly, devotion to the alleviation of social misery or to the "common good" appears to favor approaches radically different from that of the mystics. The systematic "ham-stringing" of the mystic's unique insights as they are cut to fit a theological mold can be seen as constructive in this light. They can represent an attempt to salvage something of value from the mystic's effort; to preserve his right to a non-conforming alternative while still maintaining and supporting dominant social values.

FOOTNOTES

[1] The Meadian designation of "I" and "me" is not intended here. By the "I" the mystics mean the entire conventional self.

V

TRANSMISSION OF MYSTICAL KNOWLEDGE

INTRODUCTION

The discussion of the methodology of mysticism has revealed the central dilemma of the enterprise. Mysticism purports to import knowledge. Successful practitioners maintain with considerable certainty that this is the case. However the knowledge which is ostensibly imparted is inaccessible to direct scrutiny. The knowledge itself cannot be verified except by comparison with accepted belief. Thus, while the validity of mystical knowledge is accepted in theory within the mainstream of certain orthodox religious traditions, in practice only that which reinforces or modifies slightly existing belief is acceptable. It follows that mystical knowledge is rarely accepted as knowledge by anyone other than the mystic.

Given such uncertainty, the question of recruitment and training of mystics within traditional orthodoxy is problematic. As we shall see, the solution adopted has been the maintenance of the potential for mystical practice coupled with safeguards so firm as to be positively discouraging to the zealous practitioner. It may be inferred that the stringent safeguards are established by the orthodox in order to maintain control over the actions of headstrong contemplatives who 'know'.

Not all mystics practice from within the confines of orthodoxy. In this chapter we will consider as well the career of the independent mystic. One aspect of this issue which has been a source of considerable contemporary contention is that of the role of drug use in the development of the mystical career. Both sides of this debate will be considered in this chapter together with an attempt to assess the available evidence.

The second issue related to the question of transmission is that of policy. In this chapter we will consider the mystics' relationship with the society at large. Both the mystics' obligations to society and their suggestions for society will be considered. The focus for this discussion will be an attempt to evaluate the strength of the claim that mysticism represents an extreme form of irresponsible parasitism totally devoid of social utility and hence unconscionable.

TRAINING AND RECRUITMENT

The issue of transmission of mystical knowledge to new recruits is problematic. Mysticism is a self-declared elitist pursuit. Mystics themselves have tended to discourage others from adopting the practice. The establishments in which the mystics operate have certainly tended to underplay the possibility of wide adoption of the discipline although they acknowledge the validity, in theory, of its claims. The reasons for this are obvious. Mysticism is a pursuit which is not without dangers. It is individualistic in the extreme and therefore antithetical to dogma. From the viewpoint of organized religion this can lead to hersey and error. From the individual's outlook it can culminate in the labels of madness and deviance. From the perspective of the discipline, the actions of the misguided can cast doubts on the whole activity. Clearly controls must be exerted.

Some of these controls were discussed in the methodology chapter. It is evident that these cannot be totally satisfactory given the personal nature of the practice and the stubborn conviction of authenticity which mystical experiences confer. The other primary control therefore has been restraint with respect to new recruits. These controls serve to keep the number of mystics within the established traditions to a minimum. They also limit new recruits to those demonstrating great fortitude and conviction. Suzuki, discussing the selection and training of Zen monks, expresses this philosophy:

> The Koan exercises which are the prevailing method at present of mastering Zen involves many years of close application. Naturally, there are not many graduates of the Zendo life, and this is indeed in the very nature of Zen; for Zen is meant for the elite, for specially gifted minds, and not for the masses.
>
> (1965:114)

The new recruits are expected to have been 'called'. They are in this sense self selected. It is not generally the practice to search for promising talent or for practitioners to attempt to develop likely aspirants in any way. Rather, those who "feel the mysterious action of the Spirit in their inmost being" (Johnston, 1973:44) are expected to seek out their own spiritual masters and discipline. The aspirants should already have begun the process of renunciation (Johnston, 1973:84). This course of action is endorsed for two reasons. First, it is held that only a few have any aptitude for mystical contemplation and the sacrifices that the contemplative life entails. Also initial indications must be given of a willingness to undergo the discipline which marks the career of an 'integrated' mystic - that is, one who practices with some established frame of reference or tradition.

Those who seek further mystical training are usually discouraged at the outset. For example, applicants arriving at Zen monasteries are refused entrance. They spend several days waiting in supplication before they are accepted for a probationary period into the community (Suzuki, 1965). While this practice has become routinized into a symbolic gesture, some significance remains. Madame David-Neel (1971) similarly describes the tests of fortitude which faced applicants in Tibet. Again such tests serve as a screening process or entrance examination. They have the additional function of developing the inner strength and determination necessary for the mystical life.

Once the actual training (as outlined in the methodology discussion) commences, another of the central dilemmas of mysticism emerges. It is the personal, intuitive element which lies at the root of the difficulty. Mysticism is non-cumulative. Each mystic must start afresh. Each in a sense begins as if there had never been a mysticism. There can be no building on the basis of the experience of other mystics. It is as if each scientist were required to start his work by re-discovering the most basic laws of his discipline.

There is no training in the standard sense of imparting a basis of established knowledge in mysticism. There can be none. Each mystic can hope only to duplicate in uniquely personal terms the experiences of the most advanced. It is for this reason that the unity in mysticism is both deeper and more apparent than is the case with the occult or with science. Even in the case of method the actual teaching involved is minimal. While the outlines of the method can be taught, it has not been precisely established what will work in any given case. The specific form, duration, and intensity of training must be established through trial and error.

The character of formal training of new recruits is generally non-supportive, imprecise, and haphazard. Solitary self improvement is undeniably responsible for the production of mystics. Training serves the related function of control. It maintains a recognizable order and allows for the certification and support of those mystics who are found to have 'legitimate' visions.

THE INDEPENDENT

There is an unfortunate by-product of this control. It is that many, perhaps the majority, of mystics do not submit themselves to it. These independents are of two varieties. The first simply follows a quiet solitary path of obscurity. The hero of Somerset Maugham's The Razor's Edge (1944) represents this pattern.

This character created his own mysticism, drawing from the intellectual traditions of many philosophical and religious schools. He never allied himself to any established practice or to any one belief. His development was one which followed the classical pattern of the mystical career despite his lack of formal initiation. Maugham writes of this character:

> The man I am writing about is not famous. It may be that he never will be. It may be that when his life at last comes to an end he will leave no more trace of his sojourn on earth than a stone thrown into a river leaves on the surface of the water.
>
> (1944:2)

> He is without ambition and he has no desire for fame; to become anything of a public figure would be deeply distasteful to him; and so it may be that he is satisfied to lead his chosen life and be no more than just himself. He is too modest to set himself up as an example to others; but it may be he thinks that a few uncertain souls, drawn to him like moths to a candle, will be brought in time to share his own glowing belief that ultimate satisfaction can only be found in the life of the spirit, and that by himself following with selflessness and renunciation the path of perfection he will serve as well as if he wrote books or addressed multitudes.
>
> (1944:242-243)

This would seem to summarize perfectly the career of the independent mystic. It explains why to speak of transmission in such cases fails to capture the unallied nature of the pursuit.

The second variety, however, seek notoriety and publicity. Adherents actively proselytize. Such conduct violates the usual expectations of behavior appropriate for mystics. As is stated in the Book of the Poor in Spirit:

> But they are really known to no one save those who are like them. Their treasure, which they carry within, is hidden as gold in the earth....They cannot be recognized by one who conceives truth through images.
>
> (Kelly:211)

Mystics do not seek singularity. Such attention to worldly praise contradicts the principles of their training and belief. A Tao, written in the era of Confucious by an unknown author, reinforces this requirement.

> Tao Te Ching:
>
> This is why the sage abides by actionless activity,
> And puts into practice wordless teaching.
> Since all things have been made, he does not turn
> his back on them:
> Since they have life, he does not own them
> Since they act, he does not entrust himself to them.
> When he has achieved any success, he does not stay by it,

> In this not staying by his success he is unique;
> And this is why he is not deprived of it.
>
> (Happold, 1963:150)

One can only conclude that the notorious mystics cannot be considered genuine. Their advocacy represents a psuedo-mysticism. As such it cannot be supported or justified by references to the tradition of true mysticism.

The great contemporary controversy, one which ironically has done much to revive at least a superficial interest in mysticism, concerns the role of psychedelic drugs in the production of mystical enlightenment. The modern prophets such as Leary (1971), Reich (1971), and Huxley (1963) have promised instant enlightenment through consumption of drugs. Psychedelic drugs, they claim, will short-circuit the arduous road to satori. They will eliminate the heart-breaking toil required of mystics in earlier, less technologically sophisticated times.

Leary represents the most vigorous advocacy of this position. First he suggests that consumption of a hallucinogenic drug produces powerful, transcendent experiences which are illuminative in nature. This argument is supported on the basis of personal experiences and the reports of experimental subjects.

> During the next five hours, I was whirled through an experience which could be described in many extravagant metaphors but which was, above all and without question, the deepest religious experience of my life.
>
> (1971:13)

> I have repeated this biochemical and (to me) sacramental ritual several hundred times, and almost every time I have been awed by religious revelations as shattering as the first experience.
>
> (1971:15)

Experimental support for this assertion comes from the 'Good Friday' study in which thirty subjects were observed after being given doses of a hallucinogen.

> I can say, in summary, that the results clearly support the hypothesis that, with adequate preparation and in an environment which is supportive and religiously meaningful, subjects who have taken the psychedelic drug report mystical experiences significantly more than placebo controls.
>
> (1971:15)

This mystical experience is said to convey answers to the so-called 'Seven Basic Spiritual Questions'; namely:

1. The Ultimate Power Question
2. The Life Question
3. The Human Being Question
4. The Awareness Question
5. The Ego Question
6. The Emotional Question
7. The Ultimate Escape Question

(1971:18)

Consumption of hallucinogens produces an experience which is qualitatively and quantitatively identical to that achieved by mystics. LSD, as Leary states, is the 'Western Yoga' (1971:113). On the basis of this potential, it is held that such drugs should be administered widely so that the general population could partake of this enlightenment.

> When the day comes - as it surely will - that sacramental bio-chemicals like LSD will be used as routinely and tamely as organ music and incense to assist in the attainment of religious experience.
>
> (1971:17)

A chart of 'sacramental prescriptions' is provided to assist the user in tapping various levels of consciousness and energy which are said to correspond to the seven basic spirital questions.

QUESTION	CONSCIOUSNESS LEVEL	DRUG
1. Ultimate Power	Atomic-Electronic	LSD, STP, DMT
2. Life	Cellular	peyote, LSD, mescaline, psilocybin
3. Human Being	Somatic Awareness	hashish, MDA
4. Awareness	Sensory Awareness	marijuana
5. Ego	Ego Consciousness	pep pills, caffeine
6. Emotional	Emotional Stupor	moderate alcohol
7. Ultimate Escape	Anaesthetic	narcotics, barbiturates

(1971)

Masters and Houston (1966) support the general assumption but in a more guarded fashion. They state that the ingestion of psychedelic substances holds the possibility of allowing:

> ...the average person (to) pass through new dimensions of awareness and self-knowledge to a 'transforming experience' resulting in actualization of latent capacities, philosophical re-orientation, emotional and sensory at-homeness in the world, and still other changes beneficial to the person.
>
> (1966:4)

Using material based upon observation of 206 drug sessions and extensive interviewing with another 214 persons who have used hallucinogenic drugs, they conclude that it is possible for a limited number of users to achieve the equivalent to mystical illumination through ingestion of drugs. Eleven of their 206 subjects were believed to have reached this so-called 'integral level'.

> On this level, ideation, body sensation (if any) and emotion are fused in what is felt as an absolutely purposive process culminating in a sense of total self-understanding, self-transformation, religious enlightenment, and, possibly,

> mystical union. The subject has experiences that he regards as a confrontation with the Ground of Being, God, Mysterium, Noumenon, Essence, or Fundamental Reality. The content of the experience is self-validating and known with absolute certainty to be true. Further a kind of post facto validation is forthcoming in the form of the after-effects: behavioral and other changes.
>
> (1966:148)
> (emphasis in original)

This transformation, possible for a select few, occurs only when conditions are particularly favorable. First, the subject must:

> ...meet such basic requirements as:
> 1) successful present functioning;
> 2) absence of detectable signs of psychosis or serious neurosis;
> 3) absence of past history of major mental illness;
> 4) adequate preparation for and positive expectations concerning the drug experience.
>
> (1966:12)

Further, the subject must be in some little understood fashion, 'ready' for mystical enlightenment (1966:312). Finally, the setting itself must be favorable. A guide must be present to serve as a sort of 'spiritual director'. The guide; Masters and Houston assert:

> ...should have a broad educational background including a good practical knowledge of human psychology. He should be mentally and emotionally stable and possess the capacity to stimulate feelings of security and trust in the subjects. And his experience as a guide should be sufficient to enable him to cope with emergencies and to manipulate the subject whenneed be, without, at the same time dominating or otherwise unduly interfering with the subject.
>
> (1966:131)

The session room itself must be congenial rather than antiseptic. Thus the clinical atmosphere of the hospital or the laboratory is to be avoided as anxiety provoking.

This account makes it clear that enlightenment of a truely mystical variety is not the automatic product of the drug experience. De Ropp, in another modern classic of consciousness expansion, The Master Game, (1968) suggests that other serious drawbacks accompany such enlightenment as does occur through drug useage. De Ropp accepts as fact the assertion that psychedelic drugs can, if used under the proper conditions, provide an awareness of the potential for enlightenment.

> ...this much can be said in favor of the psychedelics. If they are taken under the right conditions, with proper preparation, under the supervision of one who knows how to guide the explorer in the territory he will enter, they can, on occasion at least, be of some value. They can challenge the traveller...by awakening the traveller to his own inner potentialities.
>
> (1968:43)

Such awakening, he is quick to add, does not constitute genuine enlightenment. Real awareness can only occur when the subject can control his consciousness himself; this results only from intense mental and spiritual effort. Further, continued frequent use of such substances results in serious depletion of personal resources thereby ensuring that enlightenment will be ever unattainable.

> ...he who misuses psychedelics sacrifices his capacity to develop by persistently squandering those inner resources on which growth depends. He commits himself to a descending spiral and the further he travels down this path, the more difficult it becomes for him to reascend. Finally the power to reascend is lost altogether.
>
> (1966:44)
> (emphasis in original)

Even such qualified support is not universal. R.C. Zaehner in two major works on the subject (1972;1957) roundly condemns the notion that drug induced experiences are in any way equivalent to those of a genuine mysticism. In support of his position he quotes the Indian sage Krishnamurti:

> What is the necessity of taking drugs at all - drugs that promise a psychedelic expansion of the mind, great visions and intensity? Apparently one takes them because one's own perceptions are dull. Clarity is dimmed and one's life is rather shallow, mediocre, and meaningless; one takes them to go beyond this mediocrity...Meditation is not the mere experiencing of nor is it the pursuit of visions and delights. An immature and squalid little mind can and does have visions of expanding consciousness, and experiences which it recognizes according to its own conditioning. This immaturity may be greatly capable of making itself successful in this world and achieving fame and notoreity. The gurus whom it follows are of the same quality and state. Meditation does not belong to such as these.
>
> (1972:115)

In the same vein he quotes Zen Abbot Zenkei Shibayama:

> Recently there have been people who talk about instant enlightenment, or those who take drugs in an attempt to experience satori. Whatever claims they may make, I declare that such approaches are not authentic, true Zen at all.
>
> (1972:115)

The roots of this perceived inadequacy lie in the intellectual shallowness and manifest spiritual sloth which are seen to typify much of the movement. Neither are interpreted as symptomatic of the genuine mystical quest. Further, the absence of caution is very uncharacteristic of the mystical attitude. Mystics are cognisant of the dangers and pitfalls inherent in the method of mysticism. They attempt to protect the unprepared from these dangers. Such caution is absent from the enthusiastic prosletyzing efforts of the psychedelic advocates.

The whole question is virtually impervious to quantitative solution. The nature and quality of mystical enlightenment is notoriously difficult to assess. Even advanced contemplatives fall into error. Zen Master Harada Roshi states, for example:

> An ancient Zen saying has it that to become attached to one's own enlightenment is as much a sickness as to exhibit a maddeningly active ego. Indeed, the profounder the enlightenment, the worse the illness.
>
> (1972:98)

Historical and cross-cultural evidence is equally obscure. Concerning the alleged use of drugs by Hindu masters, Masters and Houston confidently claim that: "Presently, an estimated ninety percent of the Indian holy men use hemp, often along with other drugs." (1966:37). De Ropp meanwhile asserts with equal certainty that:

> If the spiritual heights could be ascended by taking psychedelics, then both the Sufis of Islam and the Yogis of India would have long ago discovered the fact, for the subtlest and most 'spiritual' of all psychedelics (hashish) has been available in the East for centuries. But neither in the works on Yoga nor in the writings of the Sufis does one find the taking of hashish described as a pathway to liberation.
>
> (1968:24)

One possible solution can be obtained by a re-examination of Greeley's data (1974). Masters and Houston report that only a small percent (approx. 5%) attained a mystical state while undergoing a drug experience. Greeley's national sample (in 1964) finds 18% reporting that they had a 'mystical experience' once or twice in their lifetime, 12% of the sample reported such experiences occured several times, 5% experienced them frequently. Thus we see a capacity for mystical experience being present in a rather substantial proportion of the population with at least 5% of the people being classifiable as 'natural mystics'. These experiences were reported to be triggered by a host of stimuli including music, prayer, aesthetic pleasures, solitude, sex, and exercise (1968:141).

It would seem reasonable to suggest that the psychedelic experience could indeed act as a trigger, one among many such stimuli, in cases of natural mysticism. This being the case it is also clear that the drugs are superfluous for those whose mystical awareness can be inaugurated by simple occurences as music, reading, or sex. We can also suspect that in those whose mystical capacities are minimal or non-existent, even repeated efforts with drugs will be unavailing in the attempt to produce illumination.

Far from being a vital new key to enlightenment the drugs appear to be irrelevant, and by virtue of the irresponsibility of many of the prophets of the movement, dangerous. They can be safely disregarded by those seeking a genuine mysticism since they would appear to produce mystical experience in those capable of such experience in the absence of chemical stimulation. Much of the publicity and notoreity attached to this alleged quality of psychedelic drugs arises from the reluctance to accept mystical states which has characterized our recent history. Given this reluctance, the situation of the natural mystic has been ignored or worse, negatively labelled as 'temporary insanity' of some variety. Thus the natural mystic remains 'in the closet' only to be misunderstood when he or she emerges. When a genuine need for such experience is felt in the society there is no background of awareness and information against which to measure extravagant new claims. It is in such a fashion that error and misunderstanding is perpetuated through bias and ignorance.

INTERVENTION

One of the contemporary demands of the man of knowledge is accountability. It is thought that knowledge should be justified in terms of its use. Men of knowledge are asked to harness their talents to the solution of pressing world problems. In some cases the response takes the form of a 'schizophrenic' posture - one part truth seeker, one part reformer. Others seek the truth in areas which co-incidentally are those of concern to the social community. Some adopt formal political roles in which the knowledge they have acquired fashions their blue prints for legislation or revolution. These postures are certainly immediately recognizable to the social scientist whose particular subject matter places him in the very center of demands for accountability.

It is in the light of such demands for an accounting that some of the harshest criticism is levelled against mysticism. The practice is seen as a selfish, ego-centric, and retreatist pursuit (Dunlap, 1920:40; Ghose, 1968:11). Ironically, even critics who do not accept that the phenomenon has the potential for producing knowledge consider it to be doubly damned - first as fruitless, second, as selfish.

There are four bases on which the argument of selfishness can be supported. First, the personal nature of the pursuit is intrinsically selfish. The mystic is concerned with his personal vision - with his development, his salvation, his experiences - to the exclusion of all else. The degree of single-mindedness of this pursuit obviously varies, but it can be safely said nevertheless, that the more complete the mystic, the more absorbing is this pre-occupation. It therefore can be said that the pursuit is selfish both by nature and by intent.

Second, the pursuit is retreatist in method. The justification for this accusation is similarly clear. Every aspect of the method of mysticism bespeaks retreatism. Physical detachment, personal renunciation, social insularity, withdrawal of attention, all of the stages of the method are those of retreatism. If, therefore, it is the case that one must be in society to be of benefit to it, then it is true that mystics must be condemned as retreatist in the most negative sense.

Third, the mystics can be criticized for a failure to channel their knowledge into practical, constructive prescriptions. The mystics have given, few, if any, analytic or descriptive designations. Also, they have failed to develop mechanisms for the transmission of their knowledge: whatever sharing they have done generally has been within the circle of fellow mystics. Their efforts have clearly not been focused on change.

In sum, it would seem at least superficially, that the mystics can be justly criticized for lack of accountability. Alternatively, we could justly accuse them of failure to exhibit a social conscience. The aloof stance of the mystics furthers this line of criticism. They do not appear to care about anything which troubles the rest of the world. Such unconcern is seldom considered to be a serious fault in those who are not cast in the role of 'intellectual'. It is, however, considered to be a flaw in those who claim superior knowledge.

Such a stance is hardly suprising given the package of assumptions and methods with which the mystics work. While we may applaud the fortitude with which mystics abandon the pleasures and distractions of our world; it is difficult to similarly applaud their departures from concern with the misery, poverty, war, and other ills which plague us. Nevertheless, laudable or not, the practice of mysticism demands a rejection of the material world, in its joys and its sorrows. In the absence of such a rejection, advanced contemplation is not possible.

Part of the justification for such a posture concerns the view of the 'world'...The mystic views the material world and the activities as distinctly inferior to the realm which they enter through contemplation. Such a view is re-enforced in the theological traditions from which mystics are drawn; in the stress on the superiority of matters of the spirit. The faithful are encouraged to place their attentions on the world of the spirit, the life immortal beyond the grave, the next incarnation, the acquisition of spiritual perfection. When viewed in this light the pre-occupation appears to be a natural one.

An associated belief, providing additional justification to the mystic posture of non-intervention, is that of individual destiny. It is a prevalent belief among mystics that men are 'born' into a well defined hierarchy or division of labor such that their material and spiritual contributions are in a sense 'ordained'. Some men are 'called' to serve and some to contemplate. Each role has its rights, responsibilities, and requirements. What is appropriate behavior for some is inappropriate for others. The requirements of a life of mysticism are spiritual in nature. It would therefore be wrong to deny these requirements at the expense of stressing others. The following section from the Bhagavad Gita expresses the idea:

> In the beginning
> the Lord of beings
> Created all men
> To each his duty.
> 'Do this', he said
> 'And you shall prosper.
> Duty well done
> Fulfills desire.'
>
> The ignorant work
> for the fruit of their action:
> The wise must work also
> Without desire
> Pointing man's feet
> To the path of his duty.

Let the wise beware
Lest they bewilder
the minds of the ignorant
Hungry for action:
Let them show by example
How work is holy
When the heart of the worker
is fixed on the highest.

Seer and leader,
Provider and server;
Each has his duty
Ordained by his nature
Born of the gunas.

The seer's duty,
Ordained by his nature,
Is to be tranquil
In mind and in spirit,
Self-controlled,
Austere and stainless,
Upright, forbearing;
To follow wisdom
To know Atman,
Firm of faith
In the truth that is Brahman.

The leader's duty,
Ordained by his nature,
is to be bold,
Unflinching and fearless,
Subtle of skill
And open handed,
Great hearted in battle,
A resolute ruler.

Others are born
To the tasks of providing:
These are the traders,
The cultivators,
The breeders of cattle.

To work for all men
Such is the duty
Ordained for the servers:
This is their nature.

All mankind
Is born for perfection;
And each shall attain it
Will he but follow
His nature's duty.

(Happold, 1963)

In addition, the preparatory stages of training stress the development of the virtues. Insofar as the mystic is part of the world, he is required to fulfill his responsibilities in that world. The detachment phase of training usually culminates in a state of poverty. The mystic at completion of this phase has no further material resources to utilize as aid. This is the meaning of the prescriptions in the Book of the Poor in Spirit:

> Some say that if a man abides in a contemplative life and realizes God without mediation, yet sees that his neighbour is in need, he should abandon his contemplation and come to his neighbour's assistance...But they who are wholly free from temporal things and hence have nothing with which to help their neighbours are also set free from this external work.
>
> This freedom is far more noble than employment with creatures. Christ praised the passiveness of Mary...
>
> (Kelley, 1954:182)

Finally, when speaking of the prescriptions and requirments of mysticism it must be remembered that the number of full time mystics has never been great. Zen monks, for example, labor for part of each day, following the motto "a day of no work is a day of no eating" (Suzuki, 1965:33). Members of other cloistered orders do not generally devote all of their energy to contemplation. Many of the more prominent mystics were very active in a variety of endeavours.

In other words, the life of a mystic is typically not so parasitic as might be supposed. Their principal failing can be taken as a failure to indicate ways in which their chosen path could benefit others. Such an indication can be drawn by implication if not from direct pronouncement. The mystical prescription for social reform requires inner development.

The idea of perfection develops in two different directions:

> towards self improvement and the improvement of the environment; change from without and change from within. It is easy to see that a balance and not conflict of these two impulses is what we need, though it is obvious that inner change must lead.
>
> (Ghose, 1968:61)

The mystical program stresses inner development. The solitary nature of mystical training may insulate against excessive conformity, thereby limiting the acceptive response to societal demands. This self knowledge could highlight the importance of the relationship between man and his environment, by stressing unity rather than exploitation of that environment. Such development could assist in freeing man from enslavement to the 'fetishism of commodities'.

Inner perfection has seldom been widely considered as a solution to social problems in western contemporary society. In such matters the characteristic response has been an attempt at alteration of the environment. These alterations take the form of searches for new resources, re-distribution of unequally divided resources, or changes in the manner in which resources are used. Happiness and general welfare are thought to follow from successful environmental manipulation. The most characteristic response to such problems as scarcity has not been programmed self denial, but rather search for new supplies or acceptable alternatives.

The mystic example would suggest improvement in the opposite direction. Rather than expending energy in extending material comforts, man should exert himself in the direction of freeing himself from the bondage of material things. Mystics contend that the flow of possession is not as we perceive it. They argue that things possess us, dominate our thoughts, and drain our energies. Material satisfactions, they counsel, are empty. This lust for acquisition must somehow be remedied before real development can occur. Otherwise, the levels of expectation will continue to rise, much in the fashion of wage and price spirals, and the gains will be cancelled out.

As good as this advice may be, it is unlikely to become popular. The very domination of the material which the mystics decry dooms their proposals to defeat. Suggestions in a stratified society, that development comes from inner peace and freedom from material acquisition are likely to be branded as 'fascist' by the left and 'foolish' by the right.

The program of the mystics is too radical. It is difficult to capture, even in the imagination, how a society which strictly followed their example, could function. The suspicion is that it could not. Certainly the extremely individualistic nature of mysticism would seem to mitigate against continued social order. In this light it would seem that the mystics are wise in neglecting to "push" their proposals. Perhaps the mystic path is truely elitist in fact as well as by design. The mystics should then continue to influence by example rather than through policy. As Maugham states:

> They are a shining light in the darkness. They represent an ideal that is a refreshment to their fellows; the common run may never attain it; but they respect it and it affects their lives for the good. When a man becomes pure and perfect the influence of his character spreads so that they who seek truth are naturally drawn to him.
>
> (1944:307)

VI

BASIC ASSUMPTIONS OF MAGIC

INTRODUCTION

The practice of mysticism has been shown to epitomize a private conception of knowledge. The intent of the discipline finds its focus in development of 'understanding', a 'recognition' of cosmic forces, an enhancing of awareness, and finally in the perfection of being. The practitioner therefore aims to perfect his comprehension and virtue. The knowledge acquired in such a pursuit is believed to be largely a private matter. Little effort is devoted to its public explication since such an endeavor is believed to be futile. Even the method employed in mysticism is private, personal, and self contained. The tools are the mystics' consciousness and his body. His method involves manipulation of these in an attempt to produce a particular state of consciousness in which enlightenment is believed to occur.

In magic we find an extension of the private conception of knowing. As we shall show, magicians attempt to achieve a wholly private enlightenment, similar in many respects to that sought by mystics. While they supplement the mind and body with various paraphernalia, the principal methods and tools remain concentrated in the person of the practitioner. The magician however, does not seek knowledge simply to bask in awareness: his goal is power. For the magician knowledge is indeed power since it is believed that with knowledge comes the power to alter the material environment with the force of mind alone. The magical enterprise therefore represents an attempt to utilize private knowledge to both understand and control the material environment.

In this chapter we will consider general explanations of magic. These are of four varieties: the skeptical, the religious, the psychological, and the modern. These conceptions represent views of practitioners and non-practitioners alike. In particular we will explicate the manner in which practitioners incorporate the various elements of explanation into a coherent logical scheme.

GENERAL EXPLANATIONS OF MAGIC

Skeptical

Four possible interpretations exist purporting to explain the essence of magic. The first and most familiar considers the whole enterprise to be a farcical combination of ignorance and charlatanism. Hence ceremonial magic is simply the sleight of hand which we have come to identify with night club entertainment, alchemy the product of a deluded and greedy nature, the spirit world a realm of neurotic spinsters and grief striken widows waiting to be fleeced by fake mediums. In other words, this view, which we will call the skeptical, dismisses the enterprise of magic entirely as the work of fools and frauds.

Such a view may well be entirely correct. However, to repeat a statement of aim, this study is not concerned with an assessment of the "correctness" of an approach but rather with the specific intent and goals of its practitioners. The skeptical explanation, while possibly satisfying to many, cannot account for the beliefs of the genuine practitioners. This is not to deny the existence of occultist frauds, such denial would by flying in the face of rather massive evidence (Somerlott, 1971). It is to assert that all practitioners are not conscious frauds, and that some of the conscious frauds are genuine practitioners. Fraud, in other words cannot be taken as a sure sign of the absence of genuine belief. Rather, it is in many cases incorporated into an authentic practice of magic. The cases of Madame Blavatsky (Wilson, 1971) and Eusapia Palladino (Somerlott, 1961:48) indicate that a "pressure to produce", induces frauds from even the most committed. Such a practice, Machiavellian as it may be, receives support from one of the greatest of the occult philosophers, Eliphas Levi, who states:

> Charlatanism, when it is successful, is then, in magic as in everything else, a great instrument of power. To fascinate the mob cleverly, is not that already to dominate it?
>
> (Levi, 1971;152)

> The wise who die for reason bequeath their science to fools. We must live rather for reason, while making use of folly. Hoc est arcanum magnum.
>
> (Levi, 1972:362)

That such cases involving the over-dramatizing of results, the fudging of data and so forth, are not the sole province of the occult surely needs no mention (Time, April 29, 1974;551). Science too has been its share of casualties to the pressure to produce.

Religious

The second explanation, which could be called the religious, held particular currency among primitive occultists and ceremonial magicians of the middle ages. This view sees the universe as being in the control of anthropomorphic spirits who can be coerced and controlled. The rituals of magic provide the key by which this control can be exerted. Egyptian magic, an integral part of Egyptian religious practice, was based entirely on such a view (Budge, 1899; Bromage, 1953).

> ...the magician recognizes gods but he doesn't see himself as powerless before them. He regards himself as a competitor in the field of power; considers he has an even chance in the battle of wits and wills.
>
> (Bromage, 1953:19)

> Divesting the idea of its symbolic significance, and expressing it in the simplest terms, we see that, in the eyes of the Egyptians, the god of their fathers was a magical god, not only in his fundamental creative process, but in his command of every possible potentiality of Nature. But these potentialities, these secrets of substance and destruction, could only be 'tapped' and controlled by those who gave their nights and days to the hard study and experiment necessary for the mastery of occult, invisible law.
>
> (Bromage, 1953:48)

This view of magic with its emphasis on the manipulation of "gods", 'demons', and 'forces' forms the crux of the grimoires which have come to us from the Middle Ages. These documents, using Roman Catholicism as a theological basis, deal principally that infernal evocation referred to by Waite as the "head and crown of all" (1937:7). The essence of this view of magic is summarized in this statement taken from Waite's major treatise on black and ceremonial magic:

> The main principles are summed up in the conception of a number of assumed mysterious forces in the universe which could be put in operation by man, or at least followed in their secret processes. In the ultimate, however, they could all be rendered secondary, if not passive to the will of man...This conception culminated or centered in the doctrine of unseen, intelligent, powers with whom it was possible for prepared persons to communicate; the methods by which this communication was attempted are the most important processes of magic; and the books which embody these methods, called Ceremonial Magic, are the most important part of the literature.
>
> (Waite, 1973:6)

This view of magic as 'infernal' lies at the basis of fundamentalist and Catholic condemnations of the enterprise. That is, such views acknowledge the existence of 'evil powers' but forbid any traffic with these powers.

Psychological

The third view provides an explanation which is principally psychological in nature. This accounts for occult phenomena as the products of suggestion and autosuggestion. This explanation suggests that the principal and indeed the only significant element in magical practice is belief in the efficacy of the power - the rest is irrelevent "mumbo-jumbo". Hence the magician "cures" because people believe that he can; the sorceror kills because his subjects believe that he can and so forth.[1]

The version of this explanation favored by non-occultists finds its best expression in Oesterreich's monumental work on demonic possession (1974). After an exhaustive examination of historical and cross cultural evidence concerning demonic possession he concludes:

> (the nature of the typical states of possession) ... has always consisted in phenomena of psychic compulsion, the aggravation of which not infrequently renders the victims somnambulistic. Motor hyperexcitement, however frequent it may be, is not necessarily a constituent part of possession. The appearance of possession, particularly in its gravest forms, is always in point of fact associated with belief in the devil. It is this belief which by means of autosuggestion nourishes possession and maintains it.
>
> (1974:121)

Such an explanation is more compelling due to the close association between states of demonic possession and occult activities of a certain sort. Psychic attacks of the type favored by black magicians produce states in the victims similar to those described by Oesterreich. Further, one of the principal rites of ceremonial magic involves the assumption of a godform through the calling forth of a spirit and the voluntary acceptance of a state of possession.

Just as celebrated magicians accept accusations of charlatanism on the grounds of pragmatism, so too the importance of suggestion is accepted. The difference between practitioner's and other accounts on this point is simply that magicians see the power of belief or suggestion as being part of the power of the occult but not its totality.

Levi, for example, in a discussion of occult medicine stated:

> The whole power of the occult physician is in the consciousness of his will, while the whole art consists in exciting the faith of his patient. 'If you have faith', said the Master, 'all things are possible to him who believes.'
>
> (1972:365)

Further:

> We have said that signs are the active voice of the word of will. Now, the word of will must be given in its completeness so that it may be transformed into action; and a single negligence, representing an idle speech or a doubt falsifies and paralyzes the whole process, turning back upon the operator all forces thus expended in vain.
>
> (emphasis added)
>
> (Levi, 1972:239)

Finally, Brennan expresses a similar idea in a contemporary discussion of magic:

> Belief too is just as important to the magician. ...He strains for the inner certainty, the utter conviction that he cannot fail...Without belief, the four step sequence (Desire, Belief, Action, Reaction) falls apart. The high grade occultist finds himself unable to perform an operation which would give no trouble to his simple-minded brother in the bush.
>
> (1972:18-19)

Modern

The fourth explanation combines elements from both the religious and psychological accounts with a formal occult philosophy. This fourth account is the one professed by contemporary practitioners of the occult. It can be called the modern account, being first professed formally in the works of Eliphas Levi in the late nineteenth century.[2]

The crux of this explanation is two-fold, one aspect focusing on the will of the magician, the other on the universal principles which allow the will to operate magically. Basic to such a view is the assumption that the occult arts are scientific in nature.

> ...for it is the exact and absolute science of nature and her laws.
>
> (Levi, 1973:29)

> ...true magic is the greatest of all the natural sciences...
>
> (Hartman, 1919:161)

> ...their method was in intention scientific. That is, they proposed a definite technic by which a man could compel the powers of nature to do his bidding, no less than the engineer, the chemist and the electrician.
>
> (Symonds & Grant, 1971:110)

> "It (magic) is not concerned primarily with worship, but with empirical research into the nature of the possibilities of matter."
>
> (Bromage, 1953:118)

> Coming now to philosophy, our own is that of realism and positivism. Being is by reason...All exists for us by Science. To know is to be. Science and its object become identified in the intellectual life of him who knows. To doubt is to be ignorant. Now a thing of which we are ignorant does not as yet exist for us. To live intellectually is to learn. Being develops and is amplified by science. The first conquest of science, and the first result of the exact sciences, is the sentiment of reason. The laws of nature are algebraic. Thus the sole reasonable

> faith is the adhesion of the student to theorums, the essential justice of which lies outside his knowledge, though its applications and results are demonstrated adequately to his mind...
>
> (Levi, 1972:408)

Scientific, in this sense, refers to a particular notion of nature which characterizes it as operating according to strict causal laws. The occult is then devoted to developing the power of manipulating the material world through application of these laws.

The source of radical departure from traditional notions of causality concerns the role of will. The human will, properly schooled, is seen as the causal force in magic, capable of manipulating physical objects as well as the minds of others. As Crowley states:

> ...our spiritual consciousness acts through the will and its instruments upon material objects, in order to produce changes which will result in the establishment of the new conditions of consciousness which we wish.
>
> (Symonds & Grant, 1971:110)

From Shah's work on Oriental magic:

> ...the Hindus claim that this prime material - Akasa - can be changed by means of mind, not by mechanical means.
>
> (1973:148)

From Levi:

> Magical operations are the exercise of a natural power, but one superior to the ordinary forces of Nature. They are the result of a science and a practice which exalt the human will beyond its normal limits.
>
> (1972:204)

Brennan suggests that all "normal" activities both occult and conventional can be broken into a four stage sequence; namely desire, belief, action and reaction (1972:17). Conventional behavior stresses the action stage in order to obtain the desired reaction. Occult activities stress the desire and belief stages. In other words they profess that willing the desired reaction will cause that reaction to occur.

The most ardent devotees of the occult suggest there exists almost limitless potential for the development of the magical will. For example, a Hebrew manuscript, reputed to be of the sixteenth century, gives the following as the powers of an adept:

> Hereinafter follow the powers and privileges of him who holds in his right hand the Clavicles of Solomon, and in his left the Branch of the Blossoming Almond.
> ALEPH - He beholds God face to face, without dying and converses familiarly with the seven genii who command the entire celestial army.
> BETH - He is above all griefs and all fears.
> GHIMEL - He reigns with all heaven and is served by all hell. DALETH - He rules his own health and life and can influence equally those of others. HE - He can neither be surprised by misfortune nor overwhelmed by disasters, nor can he be conquered by his enemies. VAU - He knows the reason of the past, present and future. ZAIN - He possesses the secret of the resurrection of the dead and the key of immorality.
>
> Such are the seven chief priveledges, and those which rank next are these:
>
> CHETH - To find the Philosophical Stone. TETH - To possess the Universal Medicine. IOD - To know the laws of perpetual motion and to prove the quadrature of the circle. CAPH - To change into gold not only all metals but also the earth itself, and even the refuse of the earth. LAMED - To subdue the most ferocious animals and have power to pronounce those words which paralyze and charm serpents. MEM - To have the ARS NOTORIA which gives the universal science. NUN - To speak learnedly on all subjects, without preparation and without study.
>
> These finally, are the seven least powers of the Magus:
>
> SAMECH - To know at a glance the deep things of the souls of men and the mysteries of the hearts of women. AYIN - To force Nature to make him free at his pleasure. PE - To forsee all future events which do not depend on a superior free will, or on an indiscernable cause. TSADE - To give at once and to all the most efficacious consolations and

> the most wholesome counsels. KOPH - To triumph over adversities. RESH - To conquer love and hate. SHIN - To have the secret of wealth, to be always its master and never its slave. To enjoy even poverty and never become abject or miserable. TAU - Let us add to these that the wise man rules the elements, stills tempests, cures the diseased by his touch and raises the dead.
>
> (Levi, 1972:11)

The promise of such powers is tantalizing indeed; however, most practitioners have a more modest conception of the possibilities of their endeavors. Crowley, for example, states:

> To sum up, I must incarnate the forces (aroused and directed by Will) in my own system, when I can accomplish the Result by personal effort; in anothers', physical or astral, when it depends on his efforts; in pantacles, when impersonal or elemental forces are involved as agents. As to the limits of my workings, I cannot use powers (a) which I have not got e.g. I cannot conceive a child; or powers (b) which I have paid away, or barred by a Magical Oath - e.g. I cannot make money; or powers (c) which are not in accordance with my True Will - e.g. I cannot alter the past, or make two angles of a triangle together exceed two right angles or make thistles yeild grapes. I have far less choice of action than I have in the normal state, for I am not working by order of the moods of the superficial mind, which constantly fails to observe and even tolerates, contradictions, but by virtue of the True Will, which originally charged the Talismans, and is simple, true and decided.
>
> (Symonds & Grant, 1972:150)

It should be noted that magicians do not deny that alternate, often more efficient means exist which would produce the desired goal. For example, one could earn any reasonable sum of money much more rapidly at a job than through the mechanisms of magic. Magicians recognize this (Brennan, 1972).

> It is, for instance, possible to produce a five pound note by magic. The system which will do the trick requires a minimum of four month's daily study and one month's daily application. A charlady could produce the same amount in less than a week by the simple expedient of sweeping floors.
>
> (1972:9)

The issue is apparently one of additional satisfactions attainable through magic coupled with the possibility in the case of High Magic that one will develop through this discipline the ability to achieve ends which transcend mundane potentials.

In summary, the essence of magical practice, according to contemporary practitioners, is the development of the magical will. That is, the essence lies in the idea that the will of the magician when properly schooled can serve as the instigator of a causal chain of events, producing physical changes, influencing the behavior of both the magician and others in the manner desired by the magician. Inherent in such a view is the recognition of the importance of belief (suggestion and auto-suggestion), although these are not seen as the totality of the explanation. Further, this explanation can be seen to incorporate depersonalized elements of the religious explanation. Impersonal powers are substituted for the anthropomorphic beings of the earlier explanation. As such then, this view can be seen as an extension, a development of earlier, more primitive views.

The distinction is of little significance in fact. As Shah states:

> It is true that the Sadhus (Hindu magicians) claim that their power comes exclusively from spirits, that they within themselves possess no special abilities except that of concentration. At the same time a man might believe fire to be a spirit, and still use it as he wished.
>
> (1973:143)

For some purposes, little is in a name.

OCCULT COSMOLOGY

The magical will requires a certain kind of universe in which to operate. In other words, a well developed cosmology exists justifying magical practice and at the same time providing a "rational" framework for the assumptions of its philosophy. The basic elements of this cosmology can be summarized in a few principles. Again, these have been remarkably unchanged over time. Centuries have added a certain sophistication and complexity to the basic scheme without changing its elements significantly from those employed by the primitive sorceror.

The first principle, and the one which is fundamental to those which follow, is that of the organic nature of the universe. The entire universe is seen to be One, as in one being. A fundamental "essence" permeates all aspects of this universe. The diverse parts are related according to various laws, correspondences, and reflections. Hence man is viewed as a "little Universe" or micrososm. It is this oneness which creates the potential for magic - the action of mind upon matter in conformity with the laws of the cosmos.

Bromage indicates that this principle was operative in early Egyptian magic in the form of the Idea of Acceptance.

> ...we can all become eventually all things and furthermore, that we are all things already - if we can divest ourselves of any narrow personal desire for such a consumation.
>
> (1953:52)

It receives expression in writings concerned with alchemy, as stated by Burckhardt:

> The Universal Intellect is not one numerically, but one in its indivisibility. In this way it is wholly present in each creature, and from each creature derives its uniqueness, for there is nothing which possesses more unity, wholeness, and perfection than that through which it is known.
>
> (1972:37)

Finally, Brennan, in the most contemporary account, expresses the same notion:

> The Magus is at one with the Mystic, who teaches we are at One with All. What this means, in rather more banal terms, is that you are part of the universe and subject to its laws. Because of this, everything that happens in the universe influences you, if only to an infintesimal degree. And, conversely, everything you do reacts (to the same minute degree) on the entire universe.
>
> (1972:24)

Deriving from the principle of unity is the second key principle; the Doctrine of Signatures. Simply stated, the doctrine is that:

> ...there is a correspondence or analogy between what appears and what is real, between the seen and the hidden, the microcosm in man and the macrocosm of the universe.
>
> (Symonds & Grant, 1972:ix)

This principle is found in an implicit form in primitive magic. The first manifestation of this principle in primitive magic is in the notion of imitation or analogy.

> ...as like produces like, so a result can be attained by imitating it.
>
> (Haddon, 1921:15)

> ...perceiving a similarity between the most heterogeneous objects or phenomena, and immediately establishes a causal relation between them....color acts on color....form produces a similar form....disintegration produces disintegration.... a certain state of mind produces a similar condition in living beings....
>
> (Webster, 1948:67)

Second, in the notion of contagion:

> ...the belief that objects which were once related to one another retain their connection though they may be separated, and whatever may happen to one part or object, the other part or object is similarly affected; thus, by acting upon a part of a given whole we may influence the whole as well as all its other parts.
>
> (Haddon, 1921:3)

Finally, in the belief in the power of names:

> ...a name is considered...to be part and parcel of a living being, and as magic can be performed on a person through tangible substances that have come into contact with him, so, magic can be performed through utterance of a person's name.
>
> (Haddon, 1921:22)

Occultism in Western civilization draws the notion of signatures from the "revelations" of the Emerald Table of Hermes Trismegistus.[3] (see section on the acquisition of manuscripts) The core of this manuscript, called the basis of all magic, lies in the opening statement, "as above, so below".

This principle, basically unchanged from that found in primitive magic, received sophisticated elaboration from diverse sources. Primary among these was the Kabbalah, celebrated by Levi as the "Key of the Mysteries". The Kabbalah, presents a system of correspondences based upon color, symbolism, number, letter, and eccentric interpretations of Biblical texts. Its most striking feature is its obscurity.

It is significant to note that the Kabbalah has an important role in mysticism as well as in the occult. As Ponce states:

> There are two main branches of Kabbalistic thought: the speculative and the practical. The speculative branch concerns itself soley with the operations of the spiritual universe, in an attempt to discover how it meshes with this world. Speculative Kabalism aims also at revealing how man may find a place in both dimensions at one and the same time. The practical Kabbalah is primarily concerned with winning the energies of the spiritual world for the purposes of magical control. By employing the names and offices of the angels one may control the whole of nature and its powers.
>
> (1973:52)

Concerning the occult significance of the Kabbalah, Levi states:

> There exists an occult and sacred alphabet which the Hebrews attribute to Enoch...This alphabet was known to the followers of Pythagoras, and is composed of absolute ideas attached to signs and numbers; by its combinations, it realizes the mathematics of thought...
>
> (1971:11)

> On penetrating into the sanctuary of the Kabbalah one is seized with admiration in the presence of a doctrine so logical, so simple and at the same time so absolute. The essential union of ideas and signs; the concentration of the most fundamental realities by primitive characters; the trinity of words, letters and numbers, a philosophy as simple as the alphabet, profound and infinite as the Word; theorems more complete and luminous than those of Pythagoras; a theology which may be summed up on the fingers; an infinite can be held in the hollow of an infant's hand; ten fingers and twenty - two letters, a triangle, a square and a circle: such are the elements of the Kabbalah.
>
> (1972:19)

Crowley claimed that the Kabbalah represents the universe as an elaboration of numbers. When one acquires an understanding of these numbers' nature one can refer to everything by its corresponding number (Symonds & Grant, 1971:209). In addition to the correspondences obtained from Hebraic sources, elements of Catholic symbolism and theology, Egyptian symbolism, and Eastern thought (particularly that represented by the I Ching) have been incorporated into modern schemes of correspondence.

The significance of this elaboration represents a profound gulf in modern occultism. One side, represented by Levi (1971; 1972; 1973) argues that the unravelling of these obscure sources reveals the innermost secrets of the universe hence the writings are important in and of themselves. The other faction, represented by Brennan (1972) claims that the nature of the correspondence is largely irrelevent. Placing the emphasis squarely on the magician, Brennan argues (1972:18-19) that primitive magicians operate successfully with very simple correspondences. Those successfully used by modern practitioners are much more complex. Hence, he argues, the nature of the correspondence is largely irrelevant. What is significant is the confidence which the practitioner expresses in his system. Simple analogies are too easy for modern man; he cannot have faith in them, therefore they do not work.[4] It should be noted; however, that few practitioners question their systems to this extent. The practice, with the exception of a few reflective adepts such as Crowley, Levi, and Brennan is largely unreflective and traditional in character.

The final basic principle essential to magic is that of the Astral Plane. This "plane" is variously described:

> It is a plastic medium, more fluid than the real world, easier to affect; it interpenetrates and supports the real world and is the means by which sooth-saying and clairvoyance are made possible.
>
> (Symonds & Grant, 1972:ix)

> It is formed of astral or terrestrial light, and transmits the double magnetization of it to the human body. The soul, by acting on this light through its volitions, can dissolve it or coagulate it, project it or withdraw it. It is the mirror of the imagination and of dreams. It reacts upon the nervous system, and this produces the movements of the body. This light can distill itself indefinitely and communicate its reflections at considerable distances; it magnetizes the bodies submitted to the action of man, and can, by concentrating itself, again draw them to him. It can take all the forms evoked by thought, and, in the transitory coagulations of its radiant particles, appear to the eyes; it can even offer a sort of resistance to the touch.
>
> (Levi, 1971:83)

The significance of this plane (however defined) is that it provides the medium or "culture" in which magical operations exist and operate.

It is through the Astral Body, spiritual counterpart of the physical, that the evil eye attacks. The Astral Plane houses dreams, imaginations, spirits made manifest. It is in this plane that archetypes exist: they are real because people at one time believed in their reality (Brennan, 1972:98). Mediums are thought to experience involuntary dislocations in the Astral Plane, which account for their trances and the mental and physical effects incurred (Levi, 1972:110-111).

CONCLUSION

The universe of magic is not fundamentally different from that of mysticism. Any existing differences stem from the shift in focus to the realm of matter. Magicians do not deny that the senses are imperfect and matter is but a flawed reproduction of mind, but they are not preoccupied with this problem. They cannot afford such a preoccupation since the realm of matter is part and parcel of their intentions. Similarly since the success of their endeavors find justification (to believers) in empirical results, magicians have less need than mystics to find a rationale for the enterprise. Therefore one does not find the discussions of the 'hunger for truth' variety which figure so prominently in mystical writings.

The magicians commence with a model of the universe similar to that of the mystics. To this they add the notion of signatures and the Astral plane. These two docrines provide the necessary justification for a conception of knowledge which attempts to utilize mental power to control matter. The signatures provide a link between the mental and material realm. They outline the basic laws and relationships of the cosmos. The Astral Plane provides the key to unlock these relationships since through this plane the magical will can exert its influence.

FOOTNOTES

[1] Accounts of West Indian voodoo indicate that belief may help but the sorcerer is assisted by poison and ground glass in his assassinations. (Williams:1932)

[2] Few references will be made in this discussion to Oriental magic. However, it is the central thesis of the only definitive work on the subject available in translation (Shah's Oriental Magic 1973) that there is a striking and fundamental similarity in the form and content between all magic, Eastern and Western. Therefore while Oriental references will be confined to a few illustrations, this should not be interpreted to refer to any gap in either information or unity of the system in question.

[3] "A translation of the 'Emerald Tablet', from the Latin version, is given below. For the clarification of certain points, reference is also made to the Arabic version:

1. In truth certainly and without doubt, whatever is below is like that which is above, and whatever is above is like that which is below, to accomplish the miracles of one thing.
2. Just as all things proceed from One alone by meditation on One alone, so also they are born from this one thing by adaptation.
3. Its father is the sun and its mother is the moon. The wind has borne it in its body. Its nurse is the earth.
4. It is the father of every miraculous work in the whole world.
5. Its power is perfect if it is converted into earth.
6. Separate the earth from the fire and the subtle from the gross, softly and with great prudence.
7. It rises from earth to heaven and comes down again from heaven to earth, and thus acquires the power of the realities above and the realities below. In this way you will acquire the glory of the whole world, and all darkness will leave you.
8. This is the power of all powers, for it conquers everything subtle and penetrates everything solid.
9. Thus the little world is created according to the prototype of the great world.
10. From this and in this way, marvellous applications are made.
11. For this reason I am called Hermes Trismegistos, for I possess the three parts of wisdom of the whole world.
12. Perfect is what I have said of the work of the sun."

(Burckhardt, 1972:196-197)

[4] This presents a very neat empirical question for parapsychology. One which, unfortunately, to my knowledge, no one has attempted to test.

VII

DEFINITION OF MAGICAL KNOWLEDGE

INTRODUCTION

Magic employs an essentially private conception of knowledge to accomplish the ends of both mysticism and science. That is, magicians seek to 'understand', to delineate the lawful relations of the cosmos, and to manipulate these relations. The basic assumptions of the enterprise give form and rationale to this endeavor. They are again, the principle of organic unity, the doctrine of signatures, and the principle of the astral plane.

In accordance with the dual nature of magical intent, we find that the enterprise of magic involves the acquisition of knowledge of two quite distinct varieties. These reflect the composite nature of magical practice. The first is termed within the discipline, High Magic. This practice emphasizes knowledge as enlightenment and therefore bears marked similarity to mysticism. The _type_ of knowledge sought in such a pursuit is correspondingly similar to mystical illumination.

The second major aspect or branch of magic is called Low or Natural Magic. This practice stresses knowledge as the power to manipulate the environment. The knowledge associated with this endeavor bears little resemblance to the obscure fruits of contemplation. On the other hand, the terse formulas which represent knowledge in natural magic are profoundly similar in style to the simple recipes of empirical crafts.

In this chapter the various criteria applied to distinguish knowledge within magic will be considered. We will give special attention to delimiting the distinctive features of magical knowledge and to demonstrating the manner in which these features derive from the general assumptions of the method.

HIGH MAGIC

Occultists engaged in the 'High Magic', also known as the 'Great Work' seek knowledge of the laws and essence of the universe. Their hope is that this knowledge will bring them a God-like power over the forces of nature. In addition they seek to understand and comprehend the spectacle of the cosmos, to bask in awareness. This activity is similar in intent to the goals of both science and mysticism. However the kinds of knowledge sought through magic differs from those sought by mysticism and science.

First, that which is sought in High Magic is non-empirical. Magicians engaged in High Magic are disinterested in knowledge of the empirical world as such. They believe with Plato and Augustine that the sensory world is one of mere appearances, transitory and insubstantial; that proper laws and 'forms' or 'essence' cannot be discovered from the observation of its workings. They seek, rather, knowledge of a transcendent nature, of the fundamental essence and elements which are not apprehensible even indirectly, through the senses. They desire, in other words, what they mustics term knowledge appropriate to mind. Unlike the mystics, however, the magician believes that once this knowledge is acquired, it can be used to impart information about the empirical world. The doctrine of signatures provides the key which makes this translation possible. This sentiment is revealed clearly in the following statements:

> Crowley:
>
> When science declares that it can concern itself only with that which can be measured, it classes itself with the child that counts on its fingers.
>
> (1971:233)

> Burckhardt:
>
> What is decisive for such a view is not the measurable and innumerable nature of things, conditioned as it is by temporal causes and circumstances; rather it is their essential qualities...
>
> (1972:41)

> Paracelsus:
>
> The science that deals with things which transcend sensual perception and are generally little known... Occult in fact is that which transcends the power of the external senses to perceive it; but which is fully perceptible and comprehensible to the inner spiritual understanding, after the inner senses of man have become unfolded and active.
>
> (Hartman, 1910:52)
>
> False science bases its conclusions upon external appearance caused by the illusion of the senses; true science rests in the capacity of the higher of regions of the human mind to comprehend spiritual truths which are beyond the power of perception of the semi-animal intellect, and it reasons from that which it not merely believes, but perceives to be true.
>
> (Hartman, 1910:164)

Second, this knowledge cannot be truly represented in language or concept which is rational. It is not the discursive, logical knowledge of science. It, like the mystical enlightenment, is thought to be best presented obliquely, through symbol, allegory, and analogy.

Crowley:

> Since truth is supra-rational, it is incommunicable in the language of reason.
>
> (1971:719)
>
> Magic eludes consciousness altogether...One cannot give an intellectual explanation of the rough working involved.
>
> (1971:167)

Burckhardt:

> A symbol is whatever, on the planes of the soul and the body, reproduces spiritual prototypes. In connection with this reflection of higher realities on lower planes, the imagination possesses a certain advantage over abstract thought. In the first place, it is capable of multiple interpretation; furthermore, it is not so schematic as abstract thought, and also, in so far as it 'condenses' itself into a pure image, it relies on the inverse correspondence that exists between the corporeal and spiritual realms, according to the law that 'whatever is below resembles that which is above', as the 'Emerald Table' puts it.
>
> In so far as the human intellect, as a result of a more or less complete union with the Universal Intellect, turns away from the multiplicity of things and so to say ascends towards undivided unity, so the knowledge of nature which man obtains from such an insight cannot be of a purely rational or discursive kind. For him the world has now become as if transparent: in its appearances he sees the reflection of eternal 'prototypes'. And even when this insight is not immediately present, the symbols which spring from it nevertheless arouse the memory or 'recollection' of these prototypes.
>
> (1972:40-41)

Third, the knowledge sought by occultists is both personal and absolute. It is personal in the sense that it is unique to the knower. It is held that there is some portion of the total of all knowledge which can be known only by a particular individual. This knowledge can neither be taught nor communicated; only acquired through personal endeavor. It is however, absolute. Occultists believe that their methods produce knowledge of the absolute truth, taking the form of laws not subject to error or change or probability.

Crowley:

> It can never be complete; for one thing each student must create his own Kabbalah...You are capable of perceiving one set of aspects of absolute reality, I another. The higher our attainments, the more closely will our points of view coalesce.
>
> (1971:209)

The knowledge sought can best be described as intuitive. That is, intuition is seen as a principle source or method. It is shadowy and elusive as a dream; in fact the dream state is important to magicians in this regard. Such a conception, as can be seen from the following statement from the works of Freud, is not descriptive of anything which would be considered knowledge by practitioners of science. It does not provide:

> ...new sources of knowledge or methods of research. Intuition and inspiration would be such, if they existed; but they can be safely counted as illusions, as fulfilments of wishes...Science takes account of the fact that the mind of man creates such demands and is ready to trace their source, but it has not the slightest ground for thinking them justified. On the contrary, it does well to distinguish carefully between illusion (the results of emotional demands of that kind) and knowledge.
>
> (1952:874)

This personal intuitive component of knowledge bears intimate connection with the essential nature of magic. In magic the practitioner 'charges' the ceremonies with his will. His mind is believed to be one with the physical universe. As was shown, mind is thought to influence matter. Since the powers of the mind are viewed as being unique to the magus, a reflection of his personality and proclivities, it stands to reason that the knowledge resultant from such powers should be of a highly personal nature. A comparable analogy would be with an artist who expresses his mastery by presenting 'truth' but truth marked with the indelible stamp of his individuality.

This personal component of knowledge makes communication difficult. It poses a sturdy barrier to verification. As with the mystical enterprise, this results in a situation in which virtually the only available response to practitioner's claims is one of trust based upon an _a priori_ belief or rejection based upon _a priori_ disbelief.

The personal component of the knowledge is responsible for the lack of accumulation in High Magic, an arena in which techniques and claims abound but knowledge appears to exist primarily in legend and rumor. However there is an interesting interaction between intent and result which seems to be operative here. The magical enterprise is oriented to the production of wise and powerful sages. These men can administer their wisdom to the benefit or detriment of the community. This wisdom however does not reside in a community respository. It is wholly private. The privacy is associated with both the nature of the illunation and with the necessity for the practitioner to imbue his ceremonies with the force of his will. Because there is an assumption that the knowledge obtained will be inevitably private; there is no effort expended in attempting to formulate the advances in terms which can be communicated. This lack of effort makes additional sense in the light of the power component. Magical power is not to be shared but jealously guarded to be preserved as the lore of select persons or groups.

The personal component thus acts as a barrier between the knowledge of magic and that of science. The power factor separates magic from mysticism. The magician, particularly when engaged in the 'Great Work' is attempting to translate, into a working force, the kind of vision obtained in contemplation. Thus there are attempts to fuse understanding with control. This fusion is effected in science through translation of knowledge into precise, public, quantifiable form which can then serve as a basis for application. The emphasis is on a public nature of knowledge as a key to the successful fusion. Magicians attempt to effect the same change while maintaining a private form of knowledge. This attempt is founded upon the basic assumptions of mind as an independent causal force in the production of physical effects. Thus does the basic notion of the potency of mind permeate the conception of knowledge resulting from High Magic.

NATURAL MAGIC

In natural or low magic we witness a dramatic shift in emphasis. The substance of this enterprise is linked to the growth of crafts and is oriented to the pressing problems of human survival. The practitioner studies such things as the properties of minerals and plants, the motions of planets. He provides the signs and omens, potions and elixirs which ensure the fertility of the fields, the herds, and the women. His studies produce the potions which are believed to cure disease and the problems of love, to bring success in all the varied human endeavors.

While the High Magician scorns the information of the senses and the knowledge of the sensory world, the Low Magician seeks such lore as an ultimate product. The whole of the work of Agrippa (1973) provides illustration of this scrupulous concern with natural properties, characteristics, and effects.

Whereas the work of High Magic is expressed in supralogical, supra-rational terms, that of Low Magic can be clearly expressed in mundane speech. Indeed, the formulas of Low Magic form part of the traditional folklore of many societies. The lore of both accessible and comprehensible; presented in simple recipe form. While High Magic has been, historically, chiefly the province of men, Low Magic has often been associated with the realm of women and their domestic concerns.

Natural magic has more than a simple empirical basis. There is a strong theoretical component to give the discipline a form, a rationale. This element derives from the Doctrine of Signatures and gives an explanation, albeit an incorrect explanation, for the effects produced by the various charms and potions. This theoretical component separates natural magic from pure craft or technique. The combination of a theoretical component and a technical, almost experimental, component is analogous to the combination found in science, thereby creating an appearance of similarity with the practice of science. This similarity is enhanced since correctness cannot be adequately used as a criterion for determining what is to be considered science. The use of such a criterion would require extensive periodic re-writings of history and classification as phases of current knowledge and belief in science become out-moded and are abandoned. Such a course hardly seems reasonable.

The single distinguishing characteristic separating natural magic from science in terms of a definition of knowledge is again the component of will. Natural magicians do not believe, that the properties of the substance alone are sufficient to ensure desired results. The substance must be 'charged' by the practitioner. The knowledge he seeks then is first that of empirical characteristics, second that of the self so that this focusing of will is possible. Again then we find that such beliefs ensure continued committment to private conceptions of knowledge since only part of the lore can ever be public and accessible. This mental component therefore provides the link binding High Magic with Low and serves to define the essential individuality of this intellectual pursuit.

VIII

METHODS OF MAGIC

INTRODUCTION

Magicians wish to explore the transcendent reality which is the realm of mystics. If one wishes to explore the nature of empirical reality, one will observe that reality and attempt to refine one's observations to eliminate any sources of error. If, on the other hand, one wishes to explore a reality which is non-empirical, or which transcends sensory apprehension, one must abandon observation as a primary technique. Apart from sheer speculation as a method of sorts, the replacement for observation is not immediately apparent.

Magicians have developed three methods which serve to replace observation. The first is a strong faith in primitivism; that is, the belief that the cherished secrets of occult power were once the possession of man. During the years this knowledge has been lost except for certain provocative keys. The attempt to recover this lost knowledge has been a central pre-occupation in the method of magic.

The second method has been the theoretical. It has been concerned with the expansion of the implications of occult principles, chiefly with the elaboration of the doctrine of signatures. Much of this work involves the exegesis of the "re-covered" documents of antiquity.

The final method has been experimental and involves two principle aspects; ceremonial magic and the lost science of alchemy. In experimental magic active attempts are undertaken both to expand the frontiers of occult knowledge and to manipulate the environment with the aid of knowledge acquired. In this method the principles recovered from antiquity and elaborated by the theorists are applied in experimentation. The various tools of these experiments include special words, gesture, symbolic equipment and the magical will.[1] The principle component of all such ceremonies is ecstasy induced through ritual. It is the fundamental premise of the experimental method in magic that when both external forms and internal intentions are correct, results will be ensured. Therefore, any insights or flashes of inspiration which occur as a result of or during the course of ceremonies fulfilling these requirements are to be accepted as genuine knowledge. In rejecting observation as a source of new information the occultists embrace ritually induced intuition.

The previously discussed methods will be elaborated at greater length in the section to follow.

ACQUISITION OF MANUSCRIPTS

A persistant tradition in post-primitive occultism is that of the existence of a Golden Age of ceremonial magic, an age of occult wisdom never since equalled.[2]

> Everything which is today debatable had been solved by the ancients. Before our annals began, their solutions, written in hieroglyphs, had already no longer any meaning for us. A man has re-discovered their key...
>
> (Levi, 1971:9)

This (these) Golden Age(s), variously located in time and space, have certain occult heroes associated with each particular "location". Ancient Egypt is commonly cited as a prime exemplification of the Golden Age of Magic (Bromage, 1953; Rohmer, 1970:11). Two semi-mythical characters; namely, Thoth and Hermes Trismegistus are closely associated with this era. Thoth is variously considered as human or divine. In his divine attributes he is said to be the god of magic and intelligence, author of The Book of Thoth, a principle source of occult wisdom for the Egyptians. The second Egyptian hero of the occult, Hermes Trismegistus, while similarly obscure, is reputed to be the author of the Emerald Table, a book which has been shown to lie at the foundation of occult philosophy. It should be noted that even to the ancient Egyptian priests, these alleged documents belonged to an obscure antiquity.

> .... the Egyptian priesthood conserved the art through many generations...But whence was their knowledge derived? Research along ordinary lines has failed to enlighten us upon this point.
>
> (Rohmer, 1970:11-12)

> Khamudas was consciously and sub-consciously convinced that he had laid hands on a document containing the fundamental laws of occult speech and gesture and mental dexterity.
>
> (Bromage, 1953:51)

> In Egypt, however, his initiation (Plato) could have been imperfect only, for the priests by that time had forgotten themselves the import of their primeval hieroglyphics, as is indicated by a priest who spent three days in deciphering a hieratic inscription found in the tomb of Alcmene and sent by Agesilaus, King of Sparta.
>
> (Levi, 1973:112)

King Solomon is similarly reputed to be an occult master, symbol of another Golden Age of magic (Givry, 1931:100; Shah, 1972:9). His principle works, all lost and "recovered", namely: The Key of Solomon, The Book of the Art Almdel of Solomon and the Book of Spirits - Lemegeton or the Little Key constitute according to Shah, the "most celebrated, and at the same time the most feared work in the whole of ceremonial magic" (1972:9).

In addition to these monuments, a host of lesser but nonetheless significant manuscripts are reported. These include: the works of Albertus Magnus, Of the Vertues of Hearbes, of the Vertues of Certaine Stones, of the Mervayles of the World; The Cabbalistic Secrets of Master Aptolcater, Mage of Adrianople; The Grimoire of Honorius the Great; The Grimoire Verum; The Secret Grimoire of Turiel; The Book of Sacred Magic of Abra Melin the Mage.

Possession of at least one of these documents by the magician was necessary for the practice of ceremonial magic, since the requisite spells, equipment, preparations and conditions for magical practice were contained therein. The recovery of hitherto "lost" manuscripts therefore formed a principle basis for further development in the occult. This recovery process consists of two phases: the actual "find", and its subsequent authentication.

In earlier times, where there existed a more solid occult tradition, it can be assumed that these manuscripts were transmitted from master to initiate in a fairly unbroken cycle. Even under these circumstances, however, many of the documents were lost for centuries before their alleged recovery. The Key of Solomon, for example, first appeared in Western Europe in the form of a Greek manuscript in the twelfth or thirteenth century A.D. (Cavendish, 1967;379). The first manuscripts of the Emerald Table were Arabic of uncertain date, with the first Latin manuscript appearing by 1200 A.D.

The problem of acquiring authentic versions of the grimoires, is made more difficult due to the multitudes of versions available, and, as could be expected, due to the existence of numerous forgeries. For example, regarding the Key of Solomon, Shah states;

> We know the Key in Europe through the manuscript copies which are buried in the great libraries of London, Paris and other cities. With the exception of one partial version several hundred years old (which is not obtainable); there has been no unbiased version ever seen in print, at any time. The manuscripts, diagrams and their arrangements and sequence differ from copy to copy.
>
> (1972:10)

Regarding the manuscripts of the Grimoire Verum, he continues:

> There is some mystery about actual manuscripts of the Grimoire Verum. The French version, for instance, seems to have been printed from a very incomplete copy ...The Italian versions, on the other hand, seem to have been compiled with reference to a very complete manuscript whose whereabouts is not now known.
>
> (1972:79)

The case of the Grimoire of Honorius the Great illustrates classically problems of fraud and authentication. This book is reputed to be the product of Pope Honorious III; a suspected sorcerer of the thirteenth century (Givry, 1931:101). Published copies of this work did not appear until 1670 in Rome (Cavendish, 1967:379). Waite claims that the document was forged in the late sixteenth century (1973:106). He suggests:

> ...that it is a malicious and somewhat clever imposture, which was undeniably calculated to deceive ignorant persons of its period who may have been magically inclined, more especially ignorant priests, since it pretends to

> convey the express sanction of the Apostolic Seat for the operations of Infernal Magic and Necromancy.
>
> (1973:107)

Although ostensibly a forgery, this work does provide a doctrinaire account of the workings of black magic. The power associated with the name of Honorius was such as to give rise to several subsequent forgeries, the most notable being that of the Great Albert:

> ...as is the case with the Great Albert, whose contents have no relation to the real grimoire, and were printed during the nineteenth century with the object of deceiving buyers into thinking that they were securing copies of the real book.
>
> (Shah, 1972:254)

In the face of such clearly insurmountable odds, occultists adopted several approaches to the problem of the authenticity of their documents. The first, and possibly most common, could be described as the "will to believe". In this case the finder simply accepts the document as authentic by virtue of its apparent age and/or by virtue of the curious circumstances surrounding its discovery. Such an approach is exemplified in Malchus' story of his recovery of the Secret Grimoire of Turiel. He was travelling in East Africa where he met a stranger claiming to be a priest defrocked for occult activities. This mysterious stranger offered to sell him the only existing copy of the manuscript. Malchus agreed and states: "...and thus I became the possessor of the Grimoire ...I have reason to believe that the present manuscript is the only one in existence." (Malchus, 1971:1-2). Emphasis added.

The second style involves attempted verification through historical research. This approach is employed in the works of Waite (1973), Levi (1972:1973), Shah (1972) and others. The third style, that which characterizes Crowley's more contemporary approach, considers the rituals contained in the grimoires to be guides for the will of the magician, hence of only suggestive value. Since the key to success lies within the practitioner, any ritual will be efficacious providing it conforms to basic guidelines of symbolism. Authenticity is no longer an issue in such an approach.

For the traditional practitioners possession of an authentic grimoire was considered essential. The ownership of such constituted the acquisition in a "lump sum" of the fruits of knowledge from a revered past. The concern was not with reasons for the effectiveness of the rituals, since they were deemed to be products of a divine or heroic effort and, in a sense, beyond question. Just as no knowledge of electronics or physics is necessary in order to effect adequate television reception, provided that one is in possession of a working model television and an electrical outlet, traditional occultists felt that possession of an authentic grimoire would ensure results. Similarly, alchemists of the "Puffer" (untrained, noniniate) variety searched for authentic manuscripts to guide their efforts. In this case the attempt was clearly futile since the alchemic manuscripts were written in riddles requiring a key obtainable only from a master.

> The foundation of this art is that whoever wishes to pass it on must himself have received the teaching from a master...It is also necessary that the master must often have practised in front of his pupil...For whoever knows well the order of this work and has experienced it himself, cannot be compared with one who has only sought it in books.
>
> (Burckhardt, 1972:33)

The development of a comprehensive occult philosophy which forms the crux of Levi's work marked the breaking point with this tradition.

From this point on, occultists were no longer tied to replication and exegesis alone: rather, experimental developments and extensions were possible. We therefore find in modern occultism the development of strictly personal rituals and techniques as described in Crowley's Magical Diary (Symonds & Grant, 1972) and in Brennan's work Experimental Magic (1972).

With this development (which is almost certainly a revival, although not consciously so, of a very old foundation, just as experimental science was revived rather than discovered in the Renaissance) occult activities come to resemble a scientific model at least in terms of procedure.

THEORETICAL

There is little more which can be said concerning the theoretical branch of occultism. The flower of its work is seen in the form and diversity of the experimental branch. One area about which we have not yet spoken, however, is that of divination.

The notion of divination or prediction in the occult is derived from all three of the basic principles of occultist philosophy. The past, present and future are seen as one fluid entity; approachable through the medium of the astral plane. Contact with the plane allows one to experience time at many junctures, a feat not possible in the physical plane.

The notion of signatures provides a method of translation of the revelations into an understandable language. Because different aspects, elements, and entities correspond, changes and patterns in one reflect changes and patterns in the corresponding others. Occult divination then is an attempt to locate the corresponding partner and translate the resulting findings. This is a notion of parallelism, not of causality. It is not argued that the various "auspia" and "auguria" cause the predicted outcome; rather that both the subject of the prediction and the object used to predict are part of the same pattern, bound on the same course at the time of the predictions.

This notion is discussed by C.G. Jung in his forward to the I Ching (Wilhelm, 1950):

> In other words, whoever invented the I Ching was convinced that the hexagram worked out in a certain moment coincided with the latter in quality no less than in time. To him the hexagram was the exponent of the moment in which it was cast...in as much as the hexagram was understood to be an indicator of the essential situation pervailing in the moment of its origin.
>
> This assumption involves a certain curious principle that I have termed synchronicity, a concept that formulates a point of view diametrically opposed to that of causality. Since the latter is merely a statistical truth and not absolute, it is a sort of working hypothesis of how events evolve one out of another, whereas synchronicity takes the coincidence of events in space and time as meaning something more than mere chance, namely, a peculiar interdependence of objective events in space and time among themselves as well as with the subjective (psychic) states of the observer or observers.
>
> (Wilhelm, 1950:xxiv)

CEREMONIAL MAGIC

The primary method of experimental occultism is that of ceremonial magic. An act of ceremonial magic is an attempt to manipulate the environment through application of occult principles in the ritual. The most important component of the ritual is the act of mind which charges it.

> The one common denominator in every kind of magic so far mentioned is mind. Even if you care to broaden the scope of your survey, you will find this holds good. A love potion may be chemical (or, more usually, biochemical) in

> composition, but it is designed to change the mind of the person who imbibes it. A talisman must first be charged. And this is done, one way or another, by a mental operation.
>
> (Brennan, 1972:53)

> Ceremonies have been instituted originally to give an external form to an internal act - but where the internal power to perform such acts does not exist, a ceremony will be of no avail.
>
> (Hartman, 1919:137)

This mental aspect is justified and derived directly from the principle of unity. Because, according to occult cosmology, all things in the universe are aspects of the same essence, mind and body or matter are therefore a continuum - different aspects of the same essence. Because there is no distinction between them, mind can directly influence matter.

Magical rituals bear a strong superficial resemblance to acts of worship. There is however, a distinction in terms of approach which is of considerable significance. Acts of worship are based on a recognition and acknowledgement of one's impotence in the face of higher powers. Their form tends to postures of begging, cajoling, or requesting favors. Magical operations, while recognizing the potence of the powers, gods or demons, place the operator on at least an equal basis. Ceremonial magic then is believed to deal in bargains, extortions, and manipulations of the universal forces.

The various operations of ceremonial magic can be arranged on a continuum ranging from so-called low magic to the high magic or great work. This continuum may be depicted as follows:

a) natural magic - the utilization of the occult properties of natural substances to some desired end, for example, love potions, talismans, wart charms.

b) the magical pact - a business contract with a "demon".

c) invocations - manipulation of powers through words, conjurations and spells.

d) the great work - assumptions of the god head - a radical transformation in the nature of the magician.

NATURAL MAGIC

Notions of natural magic have persisted in the folklore of many nations. Some common practices, such as the baking of ginger-bread men were originally part of the ceremonies of natural magic. The most excellent remaining document of the techniques of natural magic is Agrippa's Occult Philosophy, originally published in 1533. This work contains much of the collected lore of the subject in a systematic form. It is from this work that the bulk of the material used here is obtained.

The technique of natural magic is very simple. The practitioner masters knowledge of the system of correspondences and analogies which is part of his occult tradition. When someone comes to him with a particular problem, the appropriate influence is identified, for example Venus for problems of love. This influence suggests a host of corresponding fragrances, plants, animals, places and colors. These materials are then incorporated into a ritual to the desired end. The ritual in the case of natural magic is very simple. It can be simply a matter of concentration on the desired lover while consuming the ginger-bread man.

The particular configuration of correspondence shifts according to time and locale. The rationale, however, for all configurations is derived from the basic occult principles, chiefly from the doctrine of signatures. Two partial tables of correspondence are listed below in order to give an indication of the form which they take.

ELEMENTS

QUALITIES	EARTH	AIR	FIRE	WATER
PROPER	dry	moist	dry	moist
MEAN	cold	hot	hot	cold
	heavy	light	light	heavy
	passive	active	active	passive
	dark	dark	bright	dark
	thick	thin	thin	thick
	quiet	motion	motion	motion
BODIES	stones	plants	animals	metals
stone	dark	spongy	make fire	transparent
	heavy	light	made of fire	crystal
metal	lead	copper	gold	quicksilver
	silver	tin	iron	
animal	worm	bird	salamander	fish
	mole		lion	
plant	root	flower	seeds	leaves
MAN	bones	flesh	spirit	humors
humors	black cohler	blood	yellow cohler	phlegm
senses	feeling	hearing	sight	smell
				taste
motion	slow	cheerful	fierce	fearful
	firm	amiable	anger	sluggish
				lazy
STARS	orb	Jupiter	Mars	Saturn
	Moon	Venus	Sun	Mercury
SIGNS	Taurus	Gemini	Aries	Cancer
	Virgo	Libra	Leo	Scorpio
	Capricorn	Aquarius	Sagittarius	Pisces

(Agrippa:1973)

"STARS"

QUALITIES	SUN	MOON	SATURN	JUPITER
Elements	flame	water	earth	air
Humor	blood	phlegm	black cohler	blood
Taste	sweet	salt	sour	sweet
Metal	gold	silver	lead	tin
Stones	aetites carbuncle chrysolite topaz	crystal white stone selenite pearl beryl aquamarine	onyx sapphire jasper chalcedon loadstone	emerald green jasper
Plants	marigold peony ginger bay cedar ash ivy	palmtree rosemary olive	daffodil mandrake opium poppy pine cyprus	basil mace mint violet poplar oak holly
Animals	lion crocodile wolf baboon	dog cat swine goat chameleon	serpent scorpion toad bear ape	hart elephant sheep
Birds	eagle swan vulture hawk	geese duck heron	crane ostrich peacock owl bat	hen swallow cuckoo stork pelican
Fish	starfish pearl oyster	frog tortoise	eel lemprey	dolphin anchovy
Place	palaces theaters light places	wilds forests mountains waters	tombs churchyards caves sewers	tribunals clean places
Color	gold	white	black	purple

"STARS"

QUALITIES	MARS	VENUS	MERCURY
Elements	fire	air	water
Humor	cohler	phlegm & blood	spirit
Taste	bitter	sweet	mixed
Metal	iron	silver brass	quicksilver
Stones	diamond bloodstone amethyst	coral carnelian emerald lazuli	topaz marble agate glass
Plants	garlic radish laurel nettle onion leek mustard	violet maidenhair thyme sandalwood coriander pomegranets	hazel marjoram parsley
Animals	leopard horse gnats	calf goat dog	fox hare civet dog
Birds	crows eagle vulture owl	swan pelican turtledove sparrow	lark nightingale thrush parrot
Fish	pike sturgeon	crab whiting	mullet
Places	furnaces places of execution battlesites	fountains sea gardens	shops warehouses
Color	red	ruddy	green

> And this is the root and foundation of all bodies, natures, virtues, and wonderful works; and he which shall know these qualities of the Elements, and their mixtures, shall easily bring to pass such things that are wonderful, and astonishing, and shall be perfect in Magic.
>
> (Agrippa, 1973:40)

It should be noted that elements do not refer to elements in the sense of modern chemistry. The term refers to the four natural conditions, or essences from which other conditions are extracted. Further, it can be observed that there is some overlap in the charts between categories. Where this happens it is due to a focus on different aspects of the phenomenon. For example, dogs are associated with Mercury because of their quick sense, strength and swiftness, with Venus because of their devoted strong love, with the Moon because they seek the company of men.

Natural magic has been one of the branches of the occult which has fallen into neglect. This can probably be explained in the light of modern efficiency. The problems of interest to natural magic are simple and mundane: modern society has provided solutions to many of these problems which are much less time consuming and expensive than are those of magic. Perhaps, however, the techniques of natural magic will be revived along with the rest of the move toward "natural" foods, remedies and lifestyles.

A sample love potion:

> To make oneself beloved there shall be taken, to wit, the heart of a dove, the liver of a sparrow, the womb of a swallow, the kidney of a hare, and they shall be reduced to impalpable powder. Then the person who shall compound the philtre shall add equal part of his own blood, dried and in the same way powdered. If the person whom it is desired to draw into love is caused to swallow this powder in a

> dose of two or three drachms marvellous success will follow.
>
> (de Givry, 1931:187)

MAGICAL PACT

The idea of the demonic or magical pact has been immortalized for the West in the story of Dr. Faustus. As the story would indicate, a magical pact can be a "selling of the soul" to the devil. More generally, a pact is simply a business agreement with rights and duties clearly outlined for both parties. The "devil's" terms, while not necessarily always demanding the eternal possession of the magician's soul, did require some degree of sacrifice.

It is this demand of sacrifice which places the magical pact low on the status hierarchy of the occult. As Brennan states:

> The Pact is a concession to the poverty of the operator's resources. In black magic, as in some other processes, the necessitous must be ready to sacrifice, and the sorcerer who is insufficiently equipped must pay a higher price in the end.
>
> (1974, 162:163)

A sample pact, according to the fashion of the Dragon Rouge is quoted below.

> Emperor Lucifer, master of all the rebellious spirits, I beseech thee to be favorable to me in the calling which I make upon thy great master LUCIFUGE ROFOCALE, having desire to make a pact with him; I pray thee also, Prince Beelzebub, to protect me in my undertaking. O Count Ashtoreth! be propitious to me and cause this night the great LUCIFUGE appear unto me in human form and without any evil smell, and that grant me, by means of the pact which I shall deliver to him, all the riches of which I have need. O Great Lucifuge, I beseech thee leave thy dwelling, in whatever part of the world it may be, to come and speak with me; if not I will thereto compel thee by the power of the mighty words of the great Clavicle of Solomon, whereof he made use to force the

> rebellious spirits to accept his pact. Appear then, instantly, or I will continually torment thee by the mighty words of the Clavicle!
>
> R. I Cannot grant thy demand but on condition thou give me thyself at the end of twenty years, so that I do with thee, body and soul, what shall please me.
>
> PACT
> I promise great LUCIFUGE to repay him in twenty years for all he shall give me. In witness whereof I have signed.
>
> X..................
> (in blood)
>
> (de Givry, 1931:117)

MAGICAL INVOCATIONS

The magical invocation or conjuration marks the beginning of the works of high magic. In this method, the ritual is employed to summon specified powers and to manipulate them such that the magician's will is fulfilled. The usual requests which such ceremonies fulfilled concerned: power over the opposite sex, military expertise, power over the forces of nature, riches, knowledge, wit and talent, revenge and protection (Waite, 1973).

Similar kinds of problems are dealt with through the methods of natural magic. There is, however, an important difference between the two systems. In natural magic, the charging of the substances is of secondary importance to the actual properties of the substances employed. For example, it is because the dove is associated with Venus or the powers of sexual attraction that the love charm works, the magician's will is seen as secondary. In magical invocations, as in all the works of high magic, the will of the magician is primary. The various substances employed are used simply to create the mood, to focus his attention on the problem at hand. The substances are then of merely symbolic value.

During a conjuration the appropriate power is summoned and brought subject to command. These powers are characterized as beings with identifying appearance and personality. The usual source of their description comes from the mythology of local tradition or from that of the classical periods of sorcery - Egypt, Greece, Rome, Medieaval Europe. This personification may be regarded in a number of ways. There is little doubt that early conjurers believed that they were summoning real personages; that is, they believed that these powers lived as anthropomorphic beings. The actual beliefs of modern occultists are less clear. In any event, it is clear that the way in which a power is characterized is a peripheral issue. The occultists believe in some manner of powers which represent the law of the universe, its order, its causal principles in the abstract. This idea can be stated in varying ways. What is crucial is that the practitioner believe implicitly in whatever description he employs.

It should be remembered that occultists do not claim that dramatic and immediate results follow these ceremonies. The desired result, they believe, will follow at some later time and in a completely natural and mundane manner. If one wishes for money, the money will arrive through an unexpected inheritance, a tax return, a returned loan - it will not suddenly materialize in a pile on the kitchen table. Crowley, for example, used to conduct ceremonies with the aim of finding rich followers when he was in extreme financial straits. This makes the determination of the 'cause' of success somewhat more difficult, but at the same time makes the whole process more credible. It is possible that the ritual awakens the practitioner to possibilities which he might otherwise have ignored, the ritual could inspire confidence, or it could possibly awaken currently unknown powers in the human mind. Nevertheless, ritual success does not involve dramatic, divine or diabolic intervention.

An example of a conjuration, this one to conjure the powerful demon Astaroth, is given below. The ceremony is to be conducted in a special circle at night from ten to eleven o'clock.

> I conjure thee, Astaroth, wicked spirit, by the words and virtues of God, by the powerful God, Jesus Christ of Nazareth, unto whom all demons are submitted, Who was conceived of the Virgin Mary; by the mystery of the Angel Gabriel, I conjure thee; and again the Name of the Father, and of the Son, and of the Holy Ghost; in the name of the Glorious Virgin Mary and the Most Holy Trinity, in whose honor all the Archangels, Thrones, Dominations, Powers, Patriarchs, Prophets, Apostles, and Evangelists sign without end, Hosannah, Hosannah, Hosannah, Lord of Hosts, Who art, Who wast, Who art to come, a river of burning fire! Neglect not my commands, refuse not to come. I command thee by Him Who shall appear with flames to judge the living and the dead; unto Whom is all honor, praise and glory. Come, therefore, promptly, obey my will; appear and give praise to the true God, unto the living God, yea, unto all His works, fail not to obey me, and give honour to the Holy Ghost, in whose name I command thee.
>
> (de Givry, 1931:288)

GREAT WORK

The final phase in the experimental method involves the transformation of the magician. The aim is to design ceremonies such that the magician will be able to incorporate new powers and attributes. Since these powers have been historically represented in the form of personified gods, the operation is called the assumption of the godhead.

The individual ceremonies involved require three steps. First, everything possible about the specific god invoked must be learned. All of his characteristics, personality traits, accompanying symbols, physical appearance (the way in which artists have portrayed him) must be studied, together with all of the correspondences appropriate to the particular god. The second phase involves an appropriate summoning ritual during which the god is actually visualized if possible. The final stage involves the firm belief that the god is merging with the practitioner, that his powers become the practitioner's.

> Instead of praying to the god you said you were the god. The first step is to imagine the god. If you have any power of visualization you do see him. Then you have to imagine him moving, coming towards you, becoming you, speak-through you. It is the god speaking.
>
> (Overton-Fuller, 1965:218)

> Results of assuming a godform become evident the instant the operation is properly performed. The prime result is a staggering inflow of sheer energy, but as the practice continues, there is a gradual change in your own personality as it takes on more and more of the 'god' characteristics.
>
> (Brennan, 1972:100)

Clearly this method poses critical dangers for the mental well-being of the operator. Victor Neuburg, a magical partner of Aleister Crowley, suffered severe mental breakdowns coupled with various psychosomatic illnesses for the duration of his life after one such ceremony (Overton-Fuller:1965). One of the most pressing dangers is an over-emphasis on one aspect of development so that lack of balance ensues. Another danger clearly is that of possession, of loss of control over the resident 'god-head'.

ALCHEMY

As the whole subject matter of alchemy has remained so shrouded in mystery that we cannot be certain about either the real intent or method of the operation, analysis of this second most powerful and significant aspect of occultism has suffered.

The few facts which are available suggest the following conclusions. First, like ceremonial magic, alchemy has a long standing tradition.

> Alchemy has existed since at least the middle of the first millenium before Christ, and probably since pre-historic times. (1972:11)

So claims Burckhardt. He suggests that the operations of alchemy arose from metallurgy in primitive societies (1972:13).

Again, as with ceremonial magic, the available evidence indicates the existence of a unified tradition of alchemy.

> ...a certain principle of unity running through alchemy itself: descriptions of the 'great work' stemming from many cultures and many centuries evince, through an admitted multiplicity of symbols, certain unvarying basic symbols which are not to be explained empirically. In its essentials Indian alchemy is the same as Western, and Chinese alchemy, though set in completely spiritual climate...it can be seen to possess all the signs of a genuine tradition, that is to say, an organic and consistent - though not necessarily systematic - doctrine, and a clean-cut corpus of rules, laid down and persistently expounded by its adepts.
>
> (Burckhardt, 1972:8)

For many centuries, in diverse cultures, alchemy has served as one of the experimental methods of the occult. The precise nature of this method is, as we have stated, uncertain. It is however, quite clear that alchemy in its true form has little to do with the depictions in most historical accounts. The true alchemy did not consist in haphazard chemical experiments designed to produce gold from lead. It was not, in fact, even the principle task of alchemy to transmute metals into "nobler" forms. As de Givry states:

> Modern chemistry comes, not from alchemy, but from 'false alchemy' or the Puffer's erratic, haphazard discovery.
>
> (1931:350)

The role of such physical operations as did occur in the true alchemy is unclear. At the very least they were simply a metaphor explaining in symbolic terms the "real" operations.

> Thus, in contradistinction from the usual reproach against them, the alchemists did not seek, by means of secretly conserved formulas in which only they believed, to make gold from ordinary metals. Whoever really wished to attempt this belonged to the so-called 'charcoal burners' who, without any connection with the living alchemical tradition, and purely on the basis of a study of the texts which they could only understand in a literal sense, sought to achieve the 'great work'.
>
> (Burckhardt, 1972:25)

> 'The ignorant' saith Saint Agadom - 'when they hear us name water, think it is water of the clouds... our water (Sendivogius tells us) is a heavenly water, which wets not the hands, not that of the common man.'
>
> (Waite, 1968:272)

Discussions of physical operations in alchemy are so extensive that it seems safe to assume that they played some part in the operations. Opinions on this issue seem to agree that actual physical manipulations of matter did play some part in true alchemy but that this part was subordinate to the higher aspects of the work. As Paracelsus suggests, alchemy is:

> ...A science by which things may not only be decomposed and recomposed (as is done in chemistry), but by which their essential nature may be changed and raised higher, or be transmuted into each other...Alchemy uses life as a factor. Everything is of a threefold nature (namely spirit, soul and body) of which its material and objective form is its lowest manifestation...Certain external manipulations may assist the powers of the soul in their work but without the possession of the latter the former will be perfectly useless...There is a threefold aspect of Alchemy. In its higher aspect it teaches the regeneration of the spiritual man,...In its lowest aspect it deals with physical substances...it ends in the science of modern chemistry. True Alchemy is an exercise of the magic power of the free spiritual will of man and can therefore not be practised by anybody except by him who has been reborn in the spirit.
>
> (Hartman, 1910:40)

> ...the main objects of alchemy were the Philosopher's Stone, the Medicine of Metals, and various tinctures and elixirs possessing divers virtues; in particular those of healing disease, extending the span of life, increasing human abilities, perfecting the nature of man in every respect, conferring magical powers, and transmuting material substances, especially metals, into more valuable forms.
>
> (Crowley, 1974:289)

> The process is mystical as well as chemical. It was also the spiritual transformation of the man from a state of earthly imperfection to one of heavenly perfection.
>
> (Cavendish, 1967:165)

> ...Alchemy may be called the art of the transmutations of the soul. In saying this I am not seeking to deny that alchemists knew and practised metallurgical procedures such as the purification and alloying of metals; their real work, however, for which all these procedures were merely the outward supports or 'operational' symbols, was the transmutation of the soul.
>
> (Burckhardt, 1972:23)

It would seem that the division between physical and spiritual alchemy is similar to that between high and low magic. That is, in the low or physical, emphasis is placed on the manipulations of physical entities to some empirical end. In the case of high or spiritual operations the end is less clear. In very general terms the operations of spiritual alchemy were designed to manipulate and transform the alchemist in some unknown way.

> ...thou hast made us gods while still in our own bodies.
>
> (Cavendish, 1967:174)

Flamel, a fourteenth century alchemist, writes of the ideal ultimate transformation of the alchemist.

> ...it makes man good by effacing from him the root of all sins, namely covetousness, so that he becomes generous, mild, pious, believing, and God-fearing, however bad he may have been previously; because from now on he is continually filled with the great grace and mercy which he has received from God, and with the depth of His wonderful works.
>
> (Burckhardt, 1972:25)

The final end of the operations is said to involve the actual departure from the physical body in such a way as to not involve death in the sense in which we know it. As Paracelsus states:

> ...there are others who have no physical bodies, because they have arrived at a state of perfection in which such bodies are no longer required for their purposes...Their

> physical bodies have lost their lives...and yet they remained on earth.
>
> (Hartman, 1919:337)

These physical and spiritual manipulations reflect the cosmology of occult philosophy. The principle of unity is manifested in the concern for "essence". The essences of particular interest for alchemy are those involving the four elements; namely, earth, air, fire, water, and the fundamental essence or Materia Prima.

The elements are not to be confused with substances bearing the same name today, nor are they to be considered to be elements in the scientific sense of the term. Hence, there arises a new source of confusion for both Puffers and contemporary analysts and historians. It also makes the discovery of the real nature of the elements more difficult.

> In his book The Skeptical Chemist, published in 1661, Robert Boyle attacked the traditional doctrine of the four elements as the foundations of all corporeal materia. He demonstrated that earth, water, and air are not indivisible bodies but composed of various chemical constituents. He believed that by so doing he had destroyed alchemy in its very roots. What he had actually shattered, however, was not true alcehmy but a crude and badly understood conception of the traditional doctrine of the four elements, for true alchemy never regarded earth, water, air and fire as corporeal or chemical substances in the present day sense of the word. The four elements are simply the primary, and the most general, qualities by means of which the amorphous and purely quantitative substance of all bodies first reveals itself in differentiated form. The immutable essence of each element has like-wise nothing to do with any corporeal indivisibility, and in reality the fact that water is composed of hydrogen and oxygen and air of oxygen and nitrogen in no wise alters the immediate experience of four fundamental 'conditions'...
>
> (Burckhardt, 1972:66)

And regarding the materia prima:

> They say it is something which exists everywhere in Nature,

> but is generally regarded as worthless. It is made of animal, vegetable and mineral; it has a body, a soul and a spirit; it grows from flesh and blood; it is made of fire and water. It is a stone, but it is not a stone; unknown yet known to everyone, despised and yet unimaginably precious, coming from God but not coming from God.
>
> (Cavendish, 1967:164)

These riddles lead directly to the doctrine of signatures. It is through the study of systems of correspondence that the real nature of the elements is revealed. Drawn from Kabbalistic and astrological sources, these correspondences link processes and elements of the cosmos with characteristics of chemicals (gold, mercury, sulphur and water). These in turn are linked through analogy with biological processes and human virtues. Hence the rule "as above, so below" is applied in such a way as to allow for a single large process or working applicable to transmutation of both chemicals and souls, following the larger processes of the universe. For example, alchemical Sulphur and Mercury are said to correspond on a cosmic level to Sun and Moon, on a biological level to masculine and feminine, and on a spiritual level to spirit and soul, dark and light. All of these principles, elements, and states can then be referred to by the symbols for sun and moon, as the bride and groom, or king and queen (Burckhardt, 1972:153).

Levi also depicts a series of traditional alchemical correspondences.

AIR	EARTH	FIRE	WATER
azoth	salt	sulphur	mercury
eagle	bull	lion	man
intelligence	toil	action	knowledge
spirit	resistance	movement	light
soul	form	force	life

AIR

FIRE WATER

EARTH

(Levi, 1972:61)

Finally the method of alchemy requires a translation of these correspondences into actions of some sort. Generally speaking, the physical process consists in some combination of the following eleven consecutive stages. These stages represent a physical process accompanied by a corresponding spiritual process. Again, no agreement exists today concerning either the nature of the raw materials to be utilized or the precise method of manipulation. However, whatever the raw materials, these are the processes of manipulation:

PHYSICAL	SPIRITUAL
1. calcination	aspiration self discipline determination
2. solution	self examination self disgust insight
3. separation	self loathing exhaustion sexual sadism warring self
4. conjunction	inner balance rebirth peace
5. putrefaction	mystical death initiation
6. coagulation	peace innocence happiness absence of conflict

7. cibation	joy life energy
8. sublimation	unity of body and spirit purification
9. fermentation	unity of spiritual body and soul
10. exhaltation	unity of body, soul and spirit
11. multiplication	unity of soul and spirit

(Cavendish, 1967:192)

The significance of these processes is to replicate as closely as possible the processes of Nature in the production of life.

> An important adage of the alchemists ran as follows: 'Art is the Imitation of nature in her mode of operation.'
>
> (Burckhardt, 1972:115)

The spiritual processes of the alchemist in the great work are thought to closely approximate the tantric methods. Evidence from the papers of alchemist Thomas Vaughan points directly to this (Waite, 1968:10). Similarly, Burckhardt suggests:

> ...like the tantric methods, the alchemical work awakens a terrible natural power, which destroys the unprepared and the unqualified, but which raises the wise to spiritual supremacy. This power lives in man, but its name indicates that it is not something individual and ego-bound, but a part or aspect of an impersonal and endless rhythm.
>
> (1972:122)

These processes involve a complex of breathing exercises, physical, meditative and sexual practices designed to produce a mental and spiritual effect accompanying the physical (Crowley, 1974). The operations hope to accomplish feats considered impossible and unnatural by those who are aware of only the laws of appearances and empirical realities. The alchemists hope to accomplish the impossible through natural means - through the manipulation of the forces of nature which are not discoverable through empirical science but which they feel are knowable through the occult.

THE MAGICAL RITUAL

The nature of this magical ritual is the crux of all the forms of experimental occultism. The form and substance of a magical ritual are designed to focus concentration and to produce a kind of concerted ecstasy allowing for a controlled release of mental power. The ritual is divided into two parts; preparation and performance, discussed below.

PREPARATION

As has been noted earlier, the magician was instructed to adopt certain habits and cultivate various personal attributes to aid him in his performance. An important, if not the most crucial function of these practices was to develop powers of will and concentration. The stage of preparation for the performance of a ritual increases these demands, and can be seen as a further device for a focus of concentration of the magician upon the object of his performance.

Ritual preparations begin with a period of fasting, chastity and cleansing (Cavendish, 1967:259). The Grand Grimoire states, for example:

> You must abstain during an entire quarter of the moon from the society of females, so as to protect yourself from the possibility of impurity...to make no more than two collations daily...disrobe as seldom and sleep as little as possible during the whole of the said period,

> but meditate continually on your undertaking...
>
> (Waite, 1973:145)

The second stage in the preparation involves the construction and accumulation of the various instruments and substances to be used in the particular ceremony. These objects, in accord with the dominant magical concerns with analogy and symbolism, represent various aspects of the spirit of the magical activities. No two manuals agree with respect to the specific instructions for the preparation of even one magical implement. Neither do they agree with respect to the number and kind of implements required. For example, the True Black Magic lists as necessary:

> ...the sword, the staff, the rod, the lancet, the arctrave or hook, the boline or sickle, the needle, the poinard, a white handled knife and another knife, with a black handle, used to describe the circle.
>
> (Waite, 1973:154)

> The Grimoire Verum, which makes for simplicity, reduces the steel instruments to three, namely, knife, graver and lancet.
>
> (Waite, 1973:160)

The common features of all of these accounts do not lie in the nature of the equipment, but in the nature of the symbolic import, and in the time consuming, painstaking nature of the preparations involved. This would appear to lend additional support to the nature of magic: that is, that the essence of the magical ritual lies in the concentration of the magician, or more cynically, in the increases of his quotient for suggestibility.

A dramatic example of this concentration of symbolism and preparation serving to focus in on a mood can be seen in the discussion of preparations involved in a ceremony of infernal invocation found in Levi. This will be quoted in its entirity as follows:

> Evokers of the devil must before all things belong to a religion which admits a creative devil, who is also rival of God. To invoke a power, we must believe in it. Given such firm faith in the religion of the devil, we must proceed as follows to enter into correspondence with this pseudo-Deity:
>
> MAGICAL AXIOM
>
> Within the circle of its action, every word creates that which it affirms.
>
> DIRECT CONSEQUENCE
>
> He who affirms the devil creates or makes the devil.
>
> CONDITIONS OF SUCCESS IN INFERNAL EVOCATIONS
>
> (1) Invincible obstinacy; (2) a conscience at once hardened to crime and most prone to remorse and fear; (3) affected or natural ignorance; (4) blind faith in all that is incredible; (5) an utterly false idea of God.
>
> We must afterwards (1) profane ceremonies of the cultus in which we believe; (2) offer a bloody sacrifice; (3) procure the magic fork, which is a branch of a single bough of hazel or almond, cut at one blow with the new knife used for the sacrifice. It must terminate in a fork, which must be armoured with iron or steel, made from the blade of the knife before mentioned. A fast of fifteen days must be observed, taking a single unsalted repast after sundown. It should consist of black bread and blood, seasoned with unsalted spices or black beans and milky and narcotic herbs. We must get drunk every five days after sundown on wine in which five heads of black poppies and five ounces of pounded hemp-seek have been steeped for five hours, the infusion being strained through a cloth woven by a prostitute...The evocation should be performed on the night between Monday and Tuesday, or that between Friday and Saturday. A solitary and forbidden spot must be chosen, such as a cemetery haunted by evil spirits, a dreaded ruin in the country, the vaults of an abandoned convent, a place where some murder has been committed, a druidic altar or an old temple of idols. A black seamless and sleeveless robe must be provided; a leaden cap emblazened with the signs of the moon, Venus and Saturn; two candles of human fat set in black wooden candlesticks, carved in the shape of a crescent; two crowns of vervain; a magical

> sword with a black handle; the magical fork; a copper vase containing the blood of the victim; a censer holding perfumes, namely, incense, camphor, aloes, ambergris and storaz, mixed together with the blood of a goat, a mole and a bat; four nails taken from the coffin of an executed criminal; the head of a black cat which has been nourished on human flesh for five days; a bat drowned in blood; the horns of a goat *cum quo puella concuberit*; and the scull of a parricide...
> A perfect circle is traced by the sword, leaving, however, a break, or point of issue, on one side; a triangle is drawn in the circle, and the Pantacle thus formed is coloured with blood; a chafing-dish is placed at one of its angles...At the opposite base of the triangle three circles are described for the sorcerer and his two assistants; behind that of the first sign of the Eabarum or monogram of Constantine is drawn, not with the blood of the victim, but with the operator's own blood. He and his assistants must have bare feet and covered heads. The skin of the immolated victim must be brought also to the spot and, being cut into strips, must be placed within the circle, thus forming a second and inner circle, fixed at four corners by four nails from the coffin mentioned already. Hard by the nails, but outside the circle, must be placed the head of the cat, the human or rather inhuman skull, the horns of the goat, and the bat. They must be sprinkled with a branch of birch dipped in the blood of the victim, and then a fire of cypress and alderwood must be lighted, the two magical candles being placed on the right and left of the operator encircled with the wreaths of vervain.
>
> (Levi, 1972:317-319)

PERFORMANCE

As has been shown, the stage of preparation channels the concentration, focusing it to the specific mood and object of the ceremony. The exact form of the rituals varies widely: the substance of the rituals is designed to produce an ecstasy or trance-like state in which great outputs of mental energy are released in the direction indicated by the magical will. As Grant states:

> Ecstasy triggers the magical will. The symbol of magical will must be present in the moments of ecstasy,

> in the void following.
>
> (1973:130)

> The only magically effective symbols are those charged with the peculiar vitality of subconsciousness. Therefore desire must be formulated in symbolic terms and projected into the 'underworld'.
>
> (1973:126)

> This is working without 'lust of result' and it is the only way to work if the True Will is to be realized.
>
> (1973:130)

This notion perhaps requires some clarification through an example. Crowley's magic used sex as a means of releasing this energy. The key to success is the maintenance of "objectivity" or concentration. That is, throughout the act of ritual sexual congress, the operator must have his mind fixed on the object of the ritual, not on his partner or on his pleasure. At the same time, however, the act must be pleasant or arousing enough to produce orgasm. Crowley's magical journal (Symonds & Grant, 1972) is understandably filled with accounts of ceremonies which failed because of inability to balance intensity of pleasure with the proper mental attitude.

The form of the ceremony will be symbolically charged with the appropriate correspondences and allegories. Some combination of possible sources of controlled ecstasy will be employed to charge the ceremony with energy. These sources are:

1) total concentration through complete introversion or meditation on a symbol
2) drugs and/or alcohol
3) shock
4) music
5) dance
6) sexual activity

7) impersonal aesthetic ecstasy
8) religious enthusiasm
9) frenzied violence

(Grant, 1973:97-98)

VERIFICATION

According to the theory of magic, two requirements must be fulfilled in order to ensure success in a magical ceremony. First, the external trappings of the ritual must be correct. This is to ensure proper manipulation of the signatures. Second, the will of the magician must be perfect in terms of its strength of belief, preparedness, and fixity of attention. Failure in either area, however slight, will doom the enterprise.

The mystic's approach to enlightenment is one in which a series of disciplines are undertaken with the hope of obtaining a glimpse of knowledge at some point in time. In magic, each ceremony, each working commences with the expectation of success. Indeed without such an expectation, the ceremony is believed to be without promise. The belief of mysticism is that in the course of a long series of trials, at least one endeavor should work. The magical enterprise assumes each trial to have the potential for success. Further, each working in the magical system has some specific intent. It would therefore seem reasonable to assume that this system offers considerable potential for rigorous verification procedures.

In practice this does not prove to be the case. Verification procedures within magic are virtually nonexistent. This absence can be directly traced to the private conception of knowledge in general and the role of the magician in particular. So long as it is believed that the will of the magician must be perfect in order to ensure success, it is impossible to objectively measure success. A rationale for failure which does not challenge any of the assumptions of magic or even any of the particular connections made in a given ceremony, is ever present. This rationale is based on by the belief that successful results occur in a natural mundane fashion. The link between results and the ritual is therefore established and maintained only by belief, not by any objective evidence. In such a circumstance verification is impossible.

The situation is further complicated in the instance of ceremonies which have as an intent acquisition of knowledge. One would assume that it would be a simple matter to test for new knowledge - either one can demonstrate its presence or one cannot. However this clarity is muddled by a rather convenient circularity in this system directly traceable to the question of the definition of knowledge. Magicians assume that the 'higher' knowledge will by definition evade objectification. In its very nature therefore it will resist verification. Knowledge gained through magical operations will be received in a magical format: that is to say, it will be phrased in a language comprehensible from within magical assumptions. It can be related to objective reality only through the signatures. It is, in short, completely circular and therefore again resistant to verification.

Aleister Crowley claims that following an initiation, he received enlightenment which he recorded in his Laws. This enlightenment permitted further expansion of his magical faculties; therefore he credits its authenticity. Critics from within magic argue that the enlightenment was bogus because the voice giving instruction came from behind Crowley's left shoulder, (leftness being equated with the sinister or demonic). They argue that this was an instance of false belief rather than true knowledge. Apart from this there is no room for discussion, since the claims cannot be objectively assessed except from within the domain of magic and within this domain, as we have shown, verification in the true sense cannot proceed.

With magic as with mysticism the private conception of knowledge exerts a powerful influence. This influence limits the development of a cumulative tradition within the enterprise since verification which would allow a sorting-out of fruitful from futile procedures, efficient from inefficient techniques, is impossible. Development occurs on a purely personal basis, if it occurs at all. Even personal development is impossible to guage except in terms of practitioner's claims which are notoriously unreliable. The development of a tradition of accumulation of knowledge and the systematic refinement of claims, awaits the scientific approach which purges private conceptions of knowledge from its domain.

FOOTNOTES

1 The profound influence of the recovered manuscripts in the middle ages gave the magic of this era a ritualist (in the Mertonain sense) "cookbook" quality. The occult philosophers such as Eliphas Levi were still to come. Occultism lacked a firm base and relied on simple, unreflected repetition of the old formulas.

2 Indeed, this retrospection, so contrary to modern notions of progress, could explain much contemporary aversion to the whole tradition of ceremonial magic ie. how could any primitive people have possibly been in possession of a body of knowledge which we now do not possess?

3 Not to be confused with Crowley's work of the same name.

4 This is incidentally related to a fairly widespread expression of belief among occultists that the finding of one or another of these manuscripts is a sign of some considerable portent; part of the Master Plan of the Secret Brotherhood of adepts.

> "No book is lost; as a fact, writings go invariably precisely where they should go, and the aspirations of thought attract speech. We have proved this a hundred times in the course of our magical initiation; the rarest books have offered themselves without seeking as soon as they became indispensible. Thus we have recovered intact that universal science which so many learned persons have regarded as engulfed by a number of cataclysms; thus we have entered the great magical chain which began with Hermes or Enoch and will end only with the world.
>
> (Levi, 1972:280)

5 It should be noted that printed copies of grimoires are useless for the performance of magical rituals.

> "...the magician was expected to possess a copy written on virgin parchment with his own hand."
>
> (Shah, 1972:169)

Printed copies could be used only for securing these copies. The influence of printing undoubtedly served to enlarge the potential number of practising magicians, and at the same time to weaken the master-apprentice system which required years of devoted study, thereby weakening the quality of the product.

IX

TRANSMISSION OF MAGICAL KNOWLEDGE

INTRODUCTION

The social organization of magic has varied greatly in various historical periods. Much of this variation can be traced to the nature of societal response to the magician. This reaction is contingent upon two factors: perceived efficacy and perceived legitimacy. When the practice is considered to be both potent and legitimate, stable traditions of magic will be present. The magician in turn will have a stable role in the society. Under such conditions, transmission of magical knowledge will be institutionalized. This institutionalization is seen in many primitive societies.

When magic is considered a potent but illegitimate enterprise, the organization of the magicians will become clandestine. Under such circumstances the practice will likely be fairly widespread but organized in secret societies. Individual practitioners will abound. The traditions will be fragmented and become even more obscure in an attempt to shield the magician from the forces of social control. Active attempts at repression of the activity will be mounted. Such a mode characterized European response in the Middle Ages when the orthodoxy of the church held the practice of magic to be potent but infernal.

In societies which believe magic to be an impotent practice, reaction will likely take the form of bemused tolerance. Practitioners, who in such circumstances reject by definition the prevailing attitudes of their culture, will be rare, possibly organized in small groups. Their practice will likely be accompanied by other manifestations of deviance and their committment to magic will possibly be less sincere - a response adopted in part to register a protest, a symbolic deviance. The practice of magic under such circumstances is most clearly an instance of primitivism hence transmission will stress an attempt to revive traditions long dead.

Interestingly enough, whatever the societal response, certain constants in the transmission of occult knowledge can be discovered. An examination of these constants will provide the subject matter of this chapter. In particular, we will demonstrate the manner in which the notions of secrecy and danger permeate training of practitioners. We will also examine the notions of the ethics characterizing magical practice vis-a-vis the society at large. Finally, the personal qualities which are considered pre-requisites to successful magical workings will be discussed.

TRANSMISSION

Transmission in the occult both to new practitioners and to the general public is governed by two watchwords: secrecy and danger. The notion of secrecy has, definitively shaped occult policy regarding the general public. Occult secrets are to be kept entirely for practitioners. Dire penalties are in theory associated with the revelation of these secrets (Symonds & Grant, 1971:426). The central rationale for this practice was elaborated, according to Bromage, as early as the ancient Egyptian era; namely that the secret lore must be preserved for those trained to master it in order that the knowledge not be defiled.

> ...truths too early divulged soon degenerate into errors.
>
> (1953;11)

On a more cynical note, other reasons supporting secrecy are apparent. As magical operations center on the person, it is somewhat more difficult to restrict the number of practitioners than it would be if the operations centered on possession of an elaborate technology. Magicians who were making a good living from their operations would hardly welcome a democratization of their profession. Their vested interests would best be served by preservation of their craft as elitist and secret.

This tradition of secrecy persisted even with the publication of occult documents with the core teachings represented in the form of riddles. The words of three alchemists describe the procedure.

> Artephius:
>
> But you, poor deluded fellow, are you so simple as to believe that we would clearly and openly teach the greatest and most important of all secrets, with the result that you would take our words literally? I assure you in good faith...,that whoever would take literally what the other philosophers (that is, the other alchemists) have written, will lose himself in the recesses of a labyrinth from which he will never escape, for want of Ariadne's thread to keep him on the right path and bring him safely out.
>
> (Burckhardt, 1972:30)

Synesios:

> The (true alchemists) only express themselves in symbols, metaphors, and similes, so that they can be understood by saints, sages, and souls endowed with understanding.
>
> (Burckhardt, 1972:28)

Gerber:

> One must not explain this art in obscure words only; on the other hand, one must not explain it so clearly that all may understand it. I therefore teach it in such a way that nothing will remain hidden to the wise man, even though it may strike the mediocre minds as quite obscure; the foolish and the ignorant, for their part, will understand none of it at all.
>
> (Burckhardt, 1972:29)

In conclusion, it should be noted that this long standing tradition of secrecy has all but vanished in the irreverent and democratic age.

With respect to the training of new practitioners the doctrine of secrecy is similarly significant. Training has traditionally taken the form of sequential initiation in one of several forms. A neophyte may be taken on by a master practitioner and serve an apprenticeship. Such a technique is general in primitive social settings where the trade is often kept within a family (Webster, 1951). A second form involves joining the ranks of a secret society. Such groups are organized into grades with senior members instructing those more junior. Recent examples of such societies have been the Order of the Golden Dawn which boasted Crowley, Mathers, Waite, and William Butler Yates as some of its distinguished members. A second similar society was Crowley's Order of the Silver Star. Finally there is the technique of self initiation practised by Crowley. This technique is frequently employed where traditional masters are few, it involves the use of ceremonies through which one acquires a "guardian" or spirit guide who serves as the master or initiator (Symonds & Grant, 1971:551).

Whichever system is chosen, the basic elements remain the same. The candidate must be given the knowledge only in small, carefully graded stages, not more than he can master at one time. At each move to a higher stage the candidate must pass through some ordeal, either mental or physical, which will test his mettle. Physical ordeals can involve fasting, sleeplessness, infliction of pain, or ingestion of noxious substances such as corpse juice. Mental ordeals involve solitude and meditation. Occasionally, spiritual ordeals such as a fight with demons visualized during a meditation experience are employed. The ceremonies are shrouded in mystery to convey the potency and danger involved in the practice. Most important is the fact that the knowledge is given. The neophyte must constantly prove himself to his colleagues who reward his efforts with additional knowledge. The process is one of slow, systematic revelation. The candidate is passive, dependent for his knowledge on the will of the masters.

The initiation system serves as a device to reinforce the insularity of the occult and the marginality of its practitioners. It emphasizes the fact that occult knowledge is "beyond the pale" that members once initiated have in some senses departed from normal social life. This marginality has not always implied that the occultists have no social role. Webster (1951) discusses several roles which magicians play in primitive societies. Among these are the treatment of illness, resolution of social disputes, increasing the pool of knowledge, repressing anti-social practices, production of the fine arts. However this role tends to diminish as society becomes more complex. In complex social systems, specialization occurs as a natural function of increased division of labor. Technological development accompanies this process. The magician is supplanted since he has no particular specialization and no technology. He can do many things, but each specialist with his machines can do any given particular task better. In such circumstances the exercise of occult knowledge comes to be purely personal and private in nature.

The system of initiation is further reinforced by the real and perceived dangers inherent in occult practice. These dangers, whether or not one acknowledges the legitimacy of the occultists' claims, are undeniably real. They are of two sorts: those associated with temptation and those associated with over-extension.

Occultists believe strongly in the reality of evil: they believe there can be malice and spite and evil intentions, that wrong doings cannot all be explained by illness, necessity, and misunderstanding. They see evil in the form of a seductive temptation for the weak. Black magic holds out the promise of easy rewards since its practice does not require the strict discipline of high magic. Further, black magic is entirely self-seeking. It does not require, as does high magic, that one renounce or transcend earthly desires. The believer however feels that once this path is taken, the magician loses his potential, his chances for occult success, and finally, his soul. Non-believers, while denying perhaps that black magic leads to a loss of one's soul or of one's occult potential, nonetheless acknowledge that it is risky.

The risk for them lies in the chance of running seriously afoul of the civil authorities through black magic related activities such as murder, rape, bestiality, grave robbing, and cannibalism.

Even those who escape the dangers of evil may fall into the trap of over-extension. Believers contend that a principal danger for the neophyte involves the conjuring of forces which are too powerful to be controlled. The demons so conjured then proceed to tear the magician into pieces - figuratively through madness, or literally. The practitioner is thereby destroyed by the very forces he seeks to control. As Agrippa states:

> Whosoever doth approach unpurified calls down judgement on himself and is given over to the devouring evil spirit.
>
> (Vaughan, 1968:110)

Crowley in his account of the production of a homunculus, describes a similar danger arising from unfriendly demons:

> An ordinary man would not have touched the Thing. It was on a different plane and would no more have interfered with him than sound interfered with light. A young magician, one who had opened a gate on to that plane, but had not yet become master of that plane, might have been overcome. The Thing might even have dispossessed his ego, and used his body as its own. That is the beginner's danger in magic.
>
> (Crowley, 1969:71)

Thus, Crowley states, one may perish altogether from a moment's carelessness. It is unpardonably foolhardy to take a chance on matters of such serious import (Symonds & Grant, 1971:565).

Believers and non-believers alike can accept the presence of other dangers to the unprepared. Certain of the physical practices, similar to those used in mysticism, can prove fatal.

> I have not explained in literal detail exactly what Thomas Vaughan and his wife were up to...It killed them. Tantric and Yogic works are full of warnings of the dangers of unguarded autonomic nervous system experiments.
>
> (Waite, 1968:10)

> ...Like the Tantric methods, the alchemical work awakens a terrible natural power, which destroys the unprepared and the unqualified, but which raises the wise to spiritual supremacy.
>
> (Burckhardt, 1972:122)

Drug addiction is a further possibility. Many of the ceremonies traditionally involve the consumption of drugs as a stimulus. These drugs include opiates. Some occultists, Crowley for example, have attempted to refine their magical will through attempted mastery of the addicting drugs. This course proved unsuccessful for Crowley as his Magical Diary indicates (Symonds & Grant, 1972).

Finally, participation in occult activities may result in mental unbalance with the related consequences of psychosomatic illness and insanity. Overton-Fuller indicates that Victor Neuberg's health was destroyed through his occult activities (1965). Concerning the possibility of serious mental illness as a result of occult practice, Brennan states:

> ...it becomes important to differentiate between an Inner Plane reflection and a projection of your own unconscious mind. For this, the only tool you have is self knowledge.
>
> This is an area where, regrettably, many occultists come to grief. Unconscious projections can be both subtle and appealing. The mechanics of wish-fulfilment give you, by definition, what you have always wanted. The explosive results of occult interest without self knowledge can be seen very clearly in certain areas

> of the United States, where new cult Messiahs spring up with truly alarming regularity.
>
> Even if you do not drift into spectacular psychosis, there are a thousand lesser shades of self-deception...
>
> (1972:72)

ETHICS

Inherent in most professional education or training is some notion of ethics. That is, certain standards of professional conduct, certain attitudes of propriety vis-a-vis the public and other practitioners are generally imparted in an educational process. In the occult, the ethical stance can best be described as aloof, rather like that of science.

Occult knowledge is viewed by practitioners as morally neutral (Brennan, 1974:42). Magicians are traditionally depicted as being evil men engaged in the manipulation of forces which are similarly evil. Occultists themselves view the forces which they manipulate as being purely natural. For them, viewing these forces as evil would be as foolish as for the physicist to view gravity as evil.

They do however, view the forces as being very powerful and therefore dangerous. Furthermore, in unskilled or unscrupulous hands, even the best of forces can be used for evil purposes. This again comes as no surprise to those familiar with the uses to which science has been put. The ethical problem posed by the potential for abuse of occult forces has a number of possible solutions. In the occult the solution chosen is one of laissez-faire. The neophyte is counselled to remain morally strong and to develop his virtues. If this does not occur the other practitioners will not interfere, unless directly threatened by the black sheep's activity. No particular effort is made to protect the public from the unscrupulous practitioner.

The rationale given for this posture is two fold. First, ethical practice is seen as both morally and practically superior. It is argued that since only the good practitioner can suceed, the evil and therefore ineffective practitioner is of little concern. As Crowley states in the following quotation, the magic employed by evil men is weak and self defeating:

> It is roughly speaking, legitimate magic to resolve a difficult situation in either of these two ways. Alter it, or withdraw to higher ground. The black magician, or as I prefer to call him, sorcerer, for the word magic should not be profaned, invariably withdraws to lower planes...As his plane becomes debased, his fears grow greater...the sorcerer sells his soul for money; spends the money and finds he has nothing else to sell.
>
> (Crowley, 1969:222-224)

Second, it is the sorcerer himself who is seen to suffer from his own lack of ethics:

> The wicked fall into the pit that they have digged.
>
> (Crowley, 1969:223)

Occult activities traditionally have had the single aim of the personal advancement, in knowledge and power, of the individual practitioner. The purposes to which this knowledge are put are seen as an indication of progress. Therefore if one chooses to adopt the "black" practices it is taken as a clear sign of lack of sufficient wisdom and strength to achieve in higher magic. A classroom analogy may clarify this position. Students are often counselled that cheating on examinations hurts only themselves. Occultists view black magic as cheating, a short cut approach inherently inferior because it does not require strength and discipline, and because it corrupts the practitioner. However, the classroom teacher punishes the cheat upon discovery, thereby denying the assumption that the punishment is inherent in the act. Occultists follow through with their initial assumption, they leave the magical cheat to his own deserved fate.

This policy of non-intervention has on occasion, unpleasant consequences for the public. Black magicians have been known to wreak havoc on the unsuspecting populace. One such was the case of the infamous Giles de Rais, a French nobleman who required human sacrifice for his occult experiments.

> How many children did he disembowel after deflowering them? He himself did not know, so many were the rapes he had consummated and the murders he had committed. The texts of the times enumerate between seven and eight hundred, but the estimate is inaccurate and seems over conservative. Entire regions were devastated...At Champtoce the whole foundation room of a tower was filled with corpses.
>
> (Huysmans, 1972:157)

This policy of non-intervention, which could well have contributed to the ill repute which surrounds the occult, did not carry over to the rest of the population. Many of the occultists adopted the pose of evangelical world savers. Crowley, for example, preached his Book of the Law, with its new rule "do what thou wilt shall be the whole of the law." Cagliostro (Wilson, 1971) was a healer, as well as a patron of various occult activities. Nostrademus was known to have cured the plague. Others, such as Levi and Waite, carried out standard scholarly activities. The point is that the system here can be characterized by its absence of guidelines. Each practitioner is left to his own conscience.

THE PERSONAL QUALITIES OF THE MAGICIAN

Even the best of training cannot work with just anyone. Certain kinds of personal qualities correspond with different professional pursuits. In the occult these qualities are those associated with will, moral virtue, intelligence, and a certain constellation of attitudes regarding the society.

The fundamental quality of the magician is a highly developed will. The essential elements of this will are presented by Levi in two major occult works: Transcendental Magic (1972) and the Key of the Mysteries (1971). This general theory of will is expressed in twenty-two axioms as follows:

Axiom I

> Nothing resists the will of man, when he knows the truth, and wills the good.

Axiom II

> To will evil, is to will death. A perverse will is a beginning of suicide.

Axiom III

> To will good with violence, is to will evil, for violence produces disorder, and disorder produces evil.

Axiom IV

> One can, and one should, accept evil as the means of good; but one must never will it or do it, otherwise one would destroy with one hand what one builds with the other. Good faith never justifies bad means; it corrects them when one undergoes them, and condemns them when one takes them.

Axiom V

> To have the right to possess always, one must will patiently and long.

Axiom VI

To pass one's life in willing what it is impossible to possess always, is to abdicate life and accept the eternity of death.

Axiom VII

The more obstacles the will surmounts, the stronger it is. It is for this reason that Christ glorified poverty and sorrow.

Axiom VIII

When the will is vowed to the absurd, it is reproved by eternal reason.

Axiom IX

The will of the just man is the will of God himself, and the law of Nature.

Axiom X

It is by the will that the intelligence sees. If the will is healthy, the sight is just. God said: 'Let there be light!' and light is; the will says: 'Let the world be as I will to see it!' and the intelligence sees it as the will has willed. This is the meaning of the word, 'So be it,' which confirms acts of faith.

Axiom XI

When one creates phantoms for oneself, one puts vampires into the world, and one must nourish these children of a voluntary nightmare with one's blood, one's life, one's intelligence, and one's reason, without every satisfying them.

Axiom XII

To affirm and to will what ought to be is to create; to affirm and will what ought not to be, is to destroy.

Axiom XIII

Light is an electric fire put by Nature at the service of the will; it lights those who know how to use it, it burns those who abuse it.

Axiom XIV

The empire of the world is the empire of the light.[1]

Axiom XV

Great intellects whose wills are badly balanced are like comets which are aborted suns.

Axiom XVI

To do nothing is as fatal as to do evil, but it is more cowardly. The most unpardonable of mortal sins is inertia.

Axiom XVII

To suffer is to work. A great sorrow suffered is a progress accomplished. Those who suffer much live more than those who do not suffer.

Axiom XVIII

Voluntary death from devotion is not suicide; it is the apotheosis of the will.

Axiom XIX

Fear is nothing but idleness of the will, and for that reason public opinion scourges cowards.

Axiom XX

Succeed in not fearing the lion, and the lion will fear you. Say to sorrow: 'I will that you be a pleasure, more even than a pleasure, a happiness.'

Axiom XXI

A chain of iron is easier to break than a chain of flowers.

Axiom XXII

Before saying that a man is happy or unhappy, find out what the direction of his will has made of him:

---

[1] Meaning again the special 'light' spoken of previously - A.C.

> Tiberius died every day at Capri, while Jesus proved his immortality and even his divinity on Calvary and upon the Cross.
>
> (1971:169-172)

The substance of this theory, then, is that magical power comes only to those who have cultivated an inexorable will. The magician must be able to concentrate for long periods of time on a single thought, to focus on but a single desire. Such development is, as Levi states "outside the normal conditions of humanity". In order to achieve such development special kinds of training and mental attitudes are required.

> But in order to work miracles we must be outside the normal conditions of humanity; we must either be abstracted by wisdom or exalted by madness, either superior to all passions or outside them through ecstasy or frenzy. Such is the first and most indispensable preparation of the operator...Ye therefore who seek in science a means to satisfy your passions, pause in this fatal way: you will find nothing but madness or death...Would you reign over yourselves and others? Learn how to will.
>
> (Levi, 1972:204-205)

This passage is indicative of the special kinds of mental attributes of the magician. Further it illuminates the unique nature of the magical will; that is, the magical will is disinterested. The magician must have the ability to focus all of his being upon the object of one desire, but at the same time he must want this object for reasons apart from self interest. In order to will, one must put oneself beyond self interest, emotion and fear. As Crowley echoes:

> Each particle of one's personality is a necessary factor in the equation and every impulse must be turned to account in the Great Work.
>
> (Symonds & Grant, 1971:136)

One immediate question is that of the significance of magical ritual in the light of the efficacy of the will. This question did not trouble early occultists. The will and the ritual were both seen as necessary, inter-dependent parts of a magical operation. With the development of more self conscious occultism in the nineteenth century, the question becomes problematic. The answer given by modern students has been formed by Wilson:

> The will cannot operate in vacuo - at least, except in certain moments of pure self awareness. It needs a whole scaffolding of drama, of conviction, of purpose.
>
> (1971:356)

Again, from Levi:

> Ceremonies, vestments, perfumes, characters and figures being, as we have stated, necessary to apply imagination to the education of the will.
>
> (1972:249) emphasis added

In addition to the requirement that the magician develop an inexorable will, there are many other qualities repeatedly cited which are essential for success. The first of these is a certain charisma:

> ...a professional magician must first and foremost, as a basic pre-requisite, possess no small degree of power over the minds of his fellow men...This innate power is much increased by widespread belief in its reality; but it can make itself felt by the incredulous, and sometimes commands belief by extra ordinary manifestations.
>
> (Butler, 1948:5)

This factor is repeatedly emphasized in biographical works of the great magicians (Wilson, 1971; Rohmer, 1970; Somerlott, 1971). The great magicians from Apollonius and John Dee to Crowley and LaVey, have possessed, if nothing else, the power to attract followers who are convinced of the efficacy of the master's powers. Indeed, this conviction often persists long after the master in question has been exposed as a fraud (Somerlott, 1971).

The magician is further counselled to engage in a life of moderation. Waite recommends development of such attributes and practises as: meditation, introspection, piety, chastity, taciturnity, and justice (1973:31). Bromage suggests a similar list of desideratum of the magician: humility, patience, intelligence, knowledge, and imagination (1953:14). Levi suggests daily exercise and the cultivation of a hobby (1972:266). Further, that:

> The Magus should live in retirement and be approached with difficulty. Here is the import of the ninth Key of the Tarot, where the initiate appears as a hermit enveloped completely in his cloak. This notwithstanding, such retirement must not be one of isolation; attachments and friendships are necessary; but they must be chosen with care and preserved at all price. The Magus must have also another avocation than that of a magician. Magic is not a trade.
>
> (1972:265)

Ironically, even Crowley makes similar suggestions; recommending love and fear of God, chastity, and self discipline for those who would undertake the Great Work (Symonds & Grant, 1971:775).

In summary, we can only quote again Eliphas Levi:

> To attain the sanctum regnum, in other words, the knowledge and power of the magi, there are four indispensable conditions - an intelligence illuminated by study, an intrepidity which nothing can check, a will which nothing can break, and a discretion which nothing can corrupt. TO KNOW, TO DARE, TO WILL, TO KEEP SILENCE - such are the four words of the magus...
>
> (Cavendish, 1967:40)
> emphasis in the original

Such are the qualities proposed as desirable or necessary by practicing magicians. They are, in essence, qualities of character. To be a magician of quality, the adepts claim is to be moral, well balanced, to live a life of healthy moderation, and, above all, to cultivate the magical will.

There are, however, other qualities, equally apparent, which are described apart from the counsels of the adepts. The first of these qualities or requirements is that of a particular kind of intellect. That a skilled magician must possess at least reasonable levels of intelligence is a fact which few would dispute. Magic has traditionally required detailed study of language, particularly Latin, Greek, and Hebrew; religion; philosophy, and often science. It has been the province of the man with at least a classic liberal education in modern times. Magic, claims Bromage:

> ...in the truest interpretation of the word, demands much more sheer knowledge than is possessed by the average man...
>
> (1953:14)

The situation apparently is similar in primitive societies where magicians can be recognized, by intellect and knowledge, among other things. Webster, for example argues:

> Magicians form the intelligentsia of primitive society. They live by their wits, and their wits have to have been keen if they are to satisfy all the imperious demands laid upon them by their fellows. To natural acuteness they must add some understanding of physical phenomena; an intimate acquaintance with the properties of plants and the habits of animals; familiarity with all the lore and traditions of their community; an insight into human nature and the power of suggestion; cunning and audacity in the practice of deceit; and, not least in importance, some skill in the conjuring arts.
>
> (1948:279)

This intelligence, however, is of a particular variety. It seems a safe claim that in general the intelligent mind is both a questioning and skeptical mind. The magician's mind, if his work is to succeed, cannot afford skepticism. As has been documented earlier, practitioners are counselled that if the slightest doubt crosses their mind concerning the efficacy of their workings, then without exception, their workings will fail. Further, they are counselled that it is not sufficient to merely foster this kind of faith in the eventual power of their practice, but rather such faith must obtain for each working if any more are to prove successful. Finally, this faith must be unmoved in the face of failure, since faith alone is not considered sufficient to ensure the results, although its absence will ensure failure. The whole of Crowley's Magical Diary, for example, (Symonds & Grant, 1972) is a vivid illustration of the preservation of this faith in the face of repeated failure. Each attempted ritual which fails is rationalized in order to preserve total confidence.

In addition to possessing this singular unquestioning kind of intellect, the magician has typically been a social deviant. In fact this condition of marginality is so common as to suggest that it may perhaps be necessary. Bromage suggests, for example that Egyptian magicians were outcasts, even though magic was institutionalized in the society. This condition led to the exploitation of sensational, and in a sense, illegitimate talents (1953:14).

Biographers of occult figures have reinforced this finding (Wilson, 1971; Webb, 1974; Somerlott, 1971). That is, while practice of occult activities by their very nature tend, in both primitive and modern societies, to be isolating, there is evidence that practitioners were deviant in some respects even before they began practice. In primitive societies this deviancy often took the form of physical peculiarities - seizures, deformities and so on.

> Occult power...some persons possess it to an exceptional degree: professional magicians, by birth, inheritance, or initiation; chiefs and public functionaries so often regarded as 'sacred'; strangers, who are regularly credited with a mysterious nature making them carriers of both good and evil; persons whose physical or mental characteristics distinguish them from their fellows, such as those with body malformations or with marked psychopathic tendencies.
>
> (Webster, 1948:65)

Later, according to Wilson, these differences took a more psychic turn, featuring emotional intensity, moodiness, and immaturity. Huysmans, "greatest of the French decadents", suggests that alienation, longing for romance, nobility, and singularity, characterize the practitioner of magic in the modern world.

> ...execration of impotence, hatred of the mediocre, that, perhaps is one of the most indulgent definitions of Diabolism...one can take pride in going as far in crime as a saint in virtue.
>
> (Huysmans, 1972:54)

A feeling of hatred for the particular age is another dimension which he portrays:

> But, speaking of that kind of apparatus, Durtal, doesn't it seem to you that those hideous galvanized iron contraptions typify our utilitarian epoch? Just think, the engineer, offended by any object that hasn't a sinister or ignoble form, reveals himself entire in this invention. He tells us 'You want heat. You shall have heat - and nothing else.' Anything agreeable to the eye is out of the question."
>
> (1972:56)

Finally, these attitudes culminate with a generalized primitivism.

> Good God, what a mess! And to think that the nineteenth century takes on airs and adulates itself. There is one word in the mouths of all. Progress. Progress of what? For this miserable century hasn't invented anything great. It has constructed nothing and destroyed everything...
>
> (1972:116)

> Society has done nothing but deteriorate in the four centuries separating us from the Middle Ages.
>
> (1972:11 4)

In conclusion, it should be noted that the training in magic, like that of the mystic, stresses personal development. Such an emphasis is in keeping with the private conception of knowledge. When the person is both the tool and the receptacle of knowledge, it stands to reason that the emphasis in education will be on the perfection of the person. The stress will be in terms of self development and self discipline. As we shall see in the discussion of science, an enterprise with public orientation can utilize a social form of control with respect to practitioners.

X

BASIC ASSUMPTIONS OF SCIENCE

INTRODUCTION

We move firmly into the realm of public knowledge with the enterprise of science. The focus shifts to the empirical world; abstract notions are of utility only insofar as they can be given empirical reference or relevance. The knowledge produced, being a public product, is more tangible as a direct consequence of its separation from the person of the investigation.

In this chapter we will examine the kinds of assumptions upon which this enterprise is based. We shall see, these are very straight forward and nearly identical to those of mundane action. The assumptions considered essential are: first, the idea of order, second, the belief in the independence of the material world, third, the conviction that sense data must be utilized in the search for knowledge.

Before these assumptions are considered and developed, certain clarification is required. Accordingly we will attempt to demarcate the distinction between science and technology. We will also consider the 'Baconian' model of science in order to compare it with the model of assumptions derived from practitioner's accounts. In this analysis we will show that a reliance upon Bacon's discussion produces confusion in the area of assumptions which does not occur when one reviews practitioner's claims.

SCIENCE AND TECHNOLOGY

> The handful of disinterested men who follow truth wherever it leads cannot act directly on the masses, and masses are moved by what is at once tangible and hopeful.
>
> (Barzun, 1964:19)

One of the confusions that interferes with understanding of the nature of science is the inability to separate technology from science. Barzun defines science as:

> ...the body of rules, instruments, theorems, observations, and conceptions with the aid of which man manipulates physical nature in order to grasp its workings.
>
> (1964:14)

Conant adds:

> ...a closely interlocking set of principles and theories and a vast amount of classified information. They are also the product of a living organization.
>
> (1951:15)

> Science is an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation and are fruitful of further experimentation and observation.
>
> (1952:25)

The enterprise of science is one of the approaches to the acquisition of knowledge. Nature is interrogated in order that an understanding of her processes may be uncovered. Knowledge is presumed to be the end result of this enterprise. This knowledge is then available for exploitation.

"Technology is the process of applying knowledge for practical purposes." (Schwartz, 1971:41) This practical application is analytically distinct from science. Prior to the seventeenth century, science was the intellectual benificiary of the artisan and craftsman. They made the fundamental technical discoveries and provided the tools which established a basis for the scientists' search for knowledge.

> The tools for systematic observation and experimentation were provided by technics...During the seventeenth and eighteenth centuries, science learned a great deal from technics and offered little in return. This situation arose because the practical arts had become highly developed on an empirical basis...
>
> (1971:44)

Technology provided an empirical basis for science in the early days of scientific investigation. The development of skills carried with it a huge legacy of facts which could be translated into scientific laws and theories by those with such interests. There is no need to understand things in a comprehensive or systematic fashion in order to "make them work". One need understand nothing about physiology in order to know a poison when one is found. As Schwartz states:

> Technology is intrinsically utilitarian. It aspires to no cosmic theories of the universe or systematic theories of knowledge. Elements of 'why' do not bedevil its workings as it proceeds to build upon the 'how' of things...Pragmatism is the key concept of the engineer and the technician: a thing is successful if it accomplishes that for which it was intended.
>
> (1971:47)

In more recent times science and technology have evolved into a symbiotic partnership. As science has increased in power and accuracy, it has been able to provide knowledge which has been translated into technological achievement. Technology provides the instrumentation upon which modern science depends. Nevertheless, it is vital to remember that they are partners; they are not a single enterprise.

It is a blurring of the distinction between science and technology which is responsible for both our hostility toward and our aduration of science. We thank science for giving us an endless stream of pop-up toasters, smear-proof eyeshadows, electronic insect repellents, and all of the other necessities of modern life. At the same time it is science that we turn upon when these devices threaten to exhaust our natural resources and to corrupt our environment. When the uses to which we put technology alienate and oppress us, it is science that we blame. Barzun neatly summarizes our discontent:

> Beside the machine, which is so exact and tireless and perfect, man grows weary and careless and indifferent. He cannot compete with it and has no incentive to do aught else. Production no longer depends upon him.
>
> (1964:35)

It can therefore be argued that it is not really science that men love and hate; it is technology. Science is both 'justified' and 'condemned' through reference to the machine and the gadget. Insofar as this is the case we misunderstand science. We will return to this theme later when the disaffection with science will be considered as a motivating force encouraging recourse to mysticism and magic.

BACONIAN EMPIRICISM

The second principal misunderstanding concerning the nature of science concerns the existence of assumptions. This is the notion that science, alone among all of the intellectual pursuits, makes no a priori assumptions. Science in this view is seen as starting innocent of preconception and therefore free from bias. We owe the original formulation of this particular delusion chiefly to Francis Bacon's biting criticism of the role of theory and speculation in the acquisition of knowledge.

> The subtilty of nature is far beyond that of sense or understanding; so that the specious meditations, speculations, and theories of mankind are but a kind of insanity, only there is no one to stand by and observe it.
>
> (1952(b):197)

In his critique of the method of Aristotle Bacon again implies that science best proceeds without basic assumptions.

> Nor is much stress to be laid on his frequent recourse to experiment in his books on animals, his problems and other treatises; for he had already decided, without having properly consulted experience as the basis of his decisions and axioms, and after having so decided, he drags experiment along as a captive...
>
> (1952(b):114)

He returns again and again to this point that not only are conclusions to be discovered through experience but axioms as well. This can only be taken to mean that there are to be no axioms in the usual sense of the term. Nothing is to be taken for granted. This belief has persisted in the popular imagination lending credence to the conviction that science, because of its freedom from untested assumption, holds the only key to knowledge.

This view does not find support in the tradition of science, although it may be partially reflected in the approach of some of its practitioners. Science does indeed rest upon an act of faith. Schwartz states that:

> The history of modern science is comprised not only of the triumphs of scientific discovery and their intellectual implications but also of the development of a body of beliefs that constitute the philosophic foundations of what has become a secular religion. The whole edifice of modern science has been erected on a set of axioms whose truth can only be accepted on faith.
>
> (1971:15)

Science does indeed rest upon faith; a faith which scientists seldom venture to defend. As Whitehead candidly admits:

> (Science has)...never cared to justify its faith or to explain its meaning; and has remained blandly indifferent to its refutation by Hume.
>
> (1925:23)
>
> The world of science has always remained perfectly satisfied with its peculiar abstractions. They work and that is sufficient for it.
>
> (1925:94)

The remainder of this chapter will consider in some detail the basic faith upon which science rests.

ASSUMPTIONS

Order

The enterprise of science depends upon the existence of an ultimate order. Science represents an attempt to reveal or discover order underlying apparent disorder. It is obvious that such order must be there to be discovered. In order to commence the search, one must assume the order exists and ultimately will be revealed. This assumption is near to the mystic's faith that enlightenment exists awaiting only discovery.

The faith in this assumption can undoubtedly be traced to early observations of natural periodicity: the passage of day and night, the changing of seasons, the life cycle of plants and animals. The earliest applications of technique bringing recognition that "effect" follows "cause" in a predictable fashion would reinforce faith in basic order. Thus, the basis for assumptions necessary to science emerges from the mundane facts and behaviors of everyday life.

The interesting shift that occurs is the belief that an order exists apart from obvious "natural" periodicity. That is, the idea of order is extended and thereby subtly altered; changing from something which is readily apparent to something which is obscure, revealing itself only in an indirect fashion. Everything becomes subsumed into a system of lawful regularity. Such a shift can be associated with religious or metaphysical beliefs concerning the ultimate rationality of the universe. Alternatively the extension of the idea of order can find a basis in developing technique. Bronowski argues that in such technical discoveries as the revelation of grain in wood and stone, the assumption of underlying order is made and reinforced.

> The notion of discovering an underlying order in matter is man's basic concept for explaining nature. The architecture of things reveals a structure below the surface, a hidden grain which, when it is laid bare, makes it possible to take natural formations apart and assemble them in new arrangements. For me this is the step in the ascent of man at which theoretical science begins.
>
> (1973:95)

The discovery of the chemical transformations of combustion, in particular those associated with the smelting of metals and the creation of alloys, serves the same purpose in this development. In the discovery that copper is "hidden" in its ore and can be released through fire lies a basis for the extension of order throughout nature. Thus, although the discovery of smelting was made approximately 5000 B.C., it was not until the eighteenth century that the chemistry of combustion was understood. Nevertheless, the discovery of the regularity of the transformations, and of their subtle and obscure nature provided a strong impetus to the development of science even though the nature of the processes was not clearly understood.

The significance for the development of science of these poorly understood processes reflects light upon another interesting aspect about the scientific endeavor. Science can survive, even thrive, in the face of erroneous and dogmatic theories, incorrect observations, and underdeveloped technology. Better theory can be built from worse, observations can be improved and corrected, and technology can be developed. However, in the absence of an absolute faith in the existence of hidden order, science will die since investigation will be undermined and finally cease.

> The assumption of a uniformity in nature - a belief in the re-producibility of phenomena - is basic to all science.
>
> (Conant, 1951:33)

> ...a widespread instinctive conviction in the existence of an order of things...
>
> (Whitehead, 1925:5)

> So I want to make the assumption which the astronomer - and indeed any scientist - makes about the universe he investigates. It is this: that the same physical causes give rise to the same physical results anywhere in the universe, at any time, past, present, and future. The fuller examination of this basic assumption, and much else besides, belongs to philosophy. The scientist, for his part, makes the assumption I have mentioned as an act of faith; and he feels confirmed in that faith by his increasing ability to build up a consistent and satisfying picture of the universe and its behavior.
>
> Appleton
> (Happold, 1963:26)

The crux of the matter is this: Order must be assumed in order for investigation to be considered possible. Certain natural facts and processes lend support to this idea. Further, as investigation proceeds and appears to achieve a measure of success, the initial assumption appears to find a greater degree of confirmation. However, in the final analysis, the assumption of order cannot be proven, only accepted.

Materialism

In addition to assuming an underlying order, the scientist has adopted a thorough-going materialism and empiricist outlook. Indeed it is virtually impossible to imagine a science based upon idealism. Science assumes the existence of an independent material world.

> Physical science demands that we admit the existence of a real world independent from us, a world which we can however recognize directly but can apprehend only through the medium of our sense experiences and of the measurement mediated by them.
>
> (Planck, 1949:173)

Thus the scientist assumes that a material world exists, independent of his perceptions. It is this world which forms his subject matter. The allied assumption is that of empiricism. The data from the senses are viewed as being the most basic and best source of information about this world. A biologist, George Gaylord Simpson, expresses the assumption this way:

> Natural selection through some two billion years has ensured that our perceptions are a workable representation of the real phenomena and relationships in the world existing outside ourselves. Within certain determinable limits our sensations have to tell us truths about external phenomena, and our perceptual analyses and syntheses (and also our statements about them) have to correspond with an objective orderliness in

> nature. Otherwise we would not be here. That is how and why our sense organs and our brains evolved.
>
> (1962:8)

Implicit in this assumption is the rejection of authority, faith, and revelation as knowledge. Therein lies the root of the quarrel between science and the church. It must be noted that science does not reject authority in toto. There is indeed a rather considerable influence of authority in science as we shall show. Similarly, faith, inspiration and illumination are not completely rejected. They are acknowledged as significant sources of knowledge but not as definitive knowledge. All ideas must be tested in the light of experience - this is the role of sense data and the root of empiricism.

The scientist is not however blind to the limitations of sense data. The same facts of illusion, error, inadequacy which resulted in the disillusion of the mystics with the senses are recognized as a fact of life in science. However, the scientist responds to this problem not by rejecting sense data as a source of both observation and as knowledge, but by refining sense data in such a way as to reduce error.

This refining process has several components. First, the information received from the senses is refined through measurement.

> The practical counsel to be derived from Pythagoras, is to measure, and thus to express quality in terms of numerically determined quantity.
>
> (Whitehead, 1925:41)

> When the quantitative measurement of a variable becomes possible, the uncertainty introduced by the variable is greatly reduced and experimentation is usually enormously simplified.
>
> (Conant, 1951:103)

Quantification clarifies the sense data and helps to reveal relationships. Mathematics becomes therefore one of the most powerful tools in the advance of science.

> The birth of modern physics depended upon the application of the abstract idea of periodicity to a variety of concrete instances. But this would have been impossible, unless mathematics had already worked out in the abstract the various abstract ideas which cluster around notions of periodicity.
>
> (Whitehead, 1925:46)

The second refinement for sense data is the instrument.

> More than one significant advance in science has come about because someone has the imagination to see that a new instrument made possible the testing of an important point.
>
> (Conant, 1951:81)

The instrument refines the eye, making possible the recording of precise distinctions in sensation inaccessible to the unaided senses.

A notable example of just such an advance was Boyle's use of VonGeurick's pump to confirm Torricelli on air pressure. Indeed, Whitehead argues that advances in modern science are made only because of the finer discrimination, ingenious experiments, and new perspectives made possible by sophisticated instruments (1925:161).

Finally, the orientation of science emphasizes continuous refinement rather than sudden illumination. This allows the practitioner to live with a certain amount of error. In a system which is seen as producing increasingly closer approximations to truth, the inherent fallibility of sensation presents a major technical difficulty rather than insurmountable barrier to the acquisition of empirically based knowledge.

Metaphysics

> ...science itself is, if not an unmetaphysical, at least a non-metaphysical activity. It takes common sense for granted as well as most of what has gone before in the specialized sciences. And where it adds, alters, or upsets, it does so on the basis of an uncritical acceptance of a good deal else.
>
> (Oppenheimer, 1953:5)

As we have seen, the central assumptions of science are those of everyday life. For example, in our mundane activities we commonly act in terms of a presumption of order. We assume that all things being equal, the same cause will produce the same effect. Furthermore we act in terms of a basic materialism; our behavior is based on a presumption that the material world exists independent of our thoughts and perceptions about it. Our language is structured in accord with such a conception. Finally, in mundane affairs while we may distrust the information from our senses, we do not ignore this information in the structuring of [illegible] conduct. Such assumptions do not differ in any important sense from those basic to science. The assumptions of science have therefore a pragmatic utility even though they are not philosophically unassailable. In other words, they work, and as long as they continue to work practitioners can safely ignore them

In contrast to the other systems, science has one further distinguishing characteristic in the matter of assumptions. The scientific approach is flexible - some might say promiscuous - in the matter of metaphysics. Whereas the other systems are locked into a single metaphysical position, science remains free. This does not mean that science abandons metaphysical foundations altogether. Rather it uses them as temporary dwellings rather than permanent homes. As Max Planck stated:

> Scientific thought must link itself to something, and the bit question is where...But it has been demonstrated again and again that a final, conclusive answer cannot be found...The only conclusion which this fact permits, according to every dictate of reason, is that it is absolutely impossible to place exact science in an *a priori* manner on a universal foundation possessing a fixed and inclusive content.
>
> (1949:82)

The practice of science depends upon the existence of images. These have many important functions the most notable of which is the provision of a frame of reference giving perspective and direction to current work and discoveries. Such devices are essential to a corporate enterprise in order to allow progress and co-operative endeavor to be maximized. These images, once established, serve as "norms" in the scientific community (Mulkay, 1972).

However because science is a progressive and cumulative enterprise, these images become out-moded. Their explanatory value becomes mundane and their innovative and imaginative value is used up. Therefore, as Taylor points out, science requires new images in order to grow (1966:24). Thus:

> Such a change becomes inevitable whenever scientific inquiry hits upon a new fact in nature for which the currently accepted world picture cannot account.
>
> (Planck, 1949:98)

Metaphysical systems serve as a source or basis for these new ideas. Science adopts new philosophies to serve as a basis for current developments. These are not general to science as a whole. Thus the current basis for physics need not be similar or even compatible with that of biology. The most significant factor in this regard is that the various metaphysical assumptions which are adopted and abandoned are neither selected nor abandoned for philosophical (including logical) reasons. New assumptions are utilized as conceptual tools and discarded when they become out-moded. They are adopted for reasons which are purely pragmatic. As Ben-David states:

> It can be concluded, therefore, that although ideological bias might have played some role in the blind alleys entered by science, the philosophical assumptions that had become part of the living tradition of science were selected by scientists from the array of competing philosophies for their usefulness in the solution of specific scientific problems and not for any socially determined perspective or motive. The scientists borrowed from the philosophies' points of view or hunches for looking at a problem from a new angle but did not adopt the philosophical systems.
>
> (1971:11)

As Burett states regarding Newton:

> ...one of the most curious and exasperating features of this whole magnificent movement is that none of its great representatives appears to have known with satisfying clarity just what he was doing or how he was doing it. And as for the ultimate philosophy of the universe implied by the scientific conquests, Newton did little more than take over the ideas on such matters which had been shaped for him by his intellectual ancestry, merely bringing them occasionally up to date where his personal discoveries obviously made a difference, or re-molding them slightly into a form more palatable to his extra-scientific interests. In scientific discovery and formulation Newton was a marvelous genius; as a philosopher he was uncritical, sketchy, inconsistent, even second rate.
>
> (1925:203)

Science remains philosophically naive because of its utilitarian use of philosophy. Science and philosophy are distinct enterprises and therefore science need not satisfy philosophical standards. This helps to explain the cavalier approach which science has adopted to philosophical criticism of its assumptions and procedures.

DISCUSSION

The most striking feature of the assumptions of science, in contrast to those of mysticism and magic, is their simplicity. The assumption of order, although couched in different terminologies, is common to all three systems. Indeed it is clear that no systematic attempts to accumulate knowledge could proceed in the absence of such an assumption. Science however dispenses with such assumptions as the 'hunger for truth' doctrine of mysticism relying instead on the gradual accumulation of sufficiently warranted empirical generalizations to support the claim of order.

The emphasis of science upon the empirical realm would seem to be the crucial element in the explanation of this simplicity. Notions such as the hierarchical ordering of knowledge, the doctrine of signatures, the principle of the Astral plane, are rendered superfluous _as assumptions_, although investigation may re-introduce them into the scientific system _as findings_. This would seem to accord a greater flexibility to the scientific endeavor inasmuch as it is less firmly tied to a single set of assumptions. Furthermore scientific knowledge should accordingly be more sensitive to change and revision in the light of new inputs. This tendency is reinforced in the public emphasis of science, in particular in its requirements for stringent verification procedures.

XI

DEFINITION OF SCIENTIFIC KNOWLEDGE

INTRODUCTION

One of the reasons for the astonishing success of the scientific enterprise has been the great respect accorded scientific knowledge in contemporary times. Commencing with the Enlightenment and its love affair with Newton, the methods of science have been hailed as producing knowledge both unquestionable and eternal, beyond petty argument and dispute. This contrasted favorably with theology and philosophy which were rent by internal quarrels and seemingly irresolvable dissention. Scientific knowledge, by contrast, seemed to be the source, perhaps the only source, of truth. Further, science seemed to hold out the promise of progress to mankind. Science would serve as a secular salvation transforming the environment and human society with its discoveries. The knowledge of science was considered to embody truth, certainty, and objectivity. As Barzun states:

> Men have turned to science because it seems to give truth an exact and unalterable embodiment.
>
> (Barzun, 1964:17)

This view of science has persisted, embodied in beliefs concerning the method of science and the nature of scientific truth. The layman, Taylor asserts, maintains:

the unquestioning acceptance of the belief that science

> has proven such and such statements to be true; the findings of science correspond to reality, and are therefore inevitable, indisputable and final.
>
> (1966:4)

Widespread and persistent as this view is, it is nonetheless considered by practitioners of the craft to be false. They do not generally believe that scientific knowledge is necessarily omnipotent, certain, and eternal. What is considered knowledge in science at a given time is usually neither certain nor eternal, although it may be so proposed by its discoverer. Scientific knowledge further is objective only in a certain limited sense. Finally such knowledge is emphatically not self-evident and thereby exempt from debate and controversy. Debate over validity occupies an extremely prominent place in scientific verification. It is only to the outsider that the knowledge appears in its pure and austere garb. The scientist recognizes the role of controversy in the advance of knowledge. Scientists must fight to achieve acceptance of their findings, they must make their cases in the court of scientific law. In practice the claims which achieve recognition conform to several criteria. These are: productivity, objectivity, sufficient validity, and aesthetic appeal. These characteristics may be said to be the hallmarks of scientific knowledge.

PRODUCTIVITY

In science both isolated facts and unsupportable theories are next to worthless. Accordingly, there are in science bits of knowledge which are seen as hardly worth knowing hence as not representative of 'true knowledge'. Simple fact finding, measurement for its own sake, for example, produce this kind of knowledge. Rutherford repeatedly condemned such activities as contemptible (Oliphant. 1972:29). Selye echoes the sentiment: "facts from which no conclusions can be drawn are hardly worth knowing" (1964:103). Wilder Dwight Bancroft concurs:

> I do not object at all to people who should be accumulators becoming accumulators. When a graduate student tells me that he wishes to make exact measurements, I do not try to show him the error of his ways; I advise him to work with somebody else. I do object, however, to a student, who might have become a guesser, being forced into the ranks of the accumulators because he does not know that there is another and better type of research, and because he does not appreciate the futility of the slogan 'First get your facts'.
>
> (Selye, 1964:277)

Science which is not productive is considered next to worthless, even if it is true. Productivity can be defined in a number of ways.

Medevar suggests that productivity has two components. First is explanatory value: "their rank in the grand hierarchy of explanations and their power to establish new pedigrees of research and reasoning" (1967:125). Second is clarifying power: "the degree to which they resolve what has hither to been perplexing" (1967:125). Thus for example, the initial discovery of radium by the Curies was of greater quality in its productivity than the discovery of related radioactive elements by Otto Hahn. This is because their work explained more, predicted more, illuminated a larger field, and paved the way for a wider range of discoveries. Medevar adds that knowledge which is productive and at the same time difficult and original confers the greatest value, and correspondingly the greatest rewards.

This creates an interesting problem for the scientist. He must find work which is at once challenging, holding the promise of significance, and possible. Soluble problems must be pre-defined; a truly difficult task.

> No scientist is admired for failing in the attempt to solve problems that lie beyond his competence... research is surely the art of the soluble.
>
> (Medevar, 1967:87)

> The scientist fulfills this purpose by choosing a problem that is neither too hard nor too easy for him. For to apply himself to a problem that does not tax his facilities to the full is to waste some of his faculties; while to attack a problem that is too hard for him would waste his faculties altogether.
>
> (Polanyi, 1962:57)

Polanyi suggests similar criteria for productivity, defining it in terms of the "systematic importance" of the contribution (1962:58). To this "systematic importance" is added originality: "the surprise caused by a discovery, which causes us to admire its daring and ingenuity" (1962:58). Thus to be considered worthwhile knowledge, a finding in science should maximize productivity and originality.

OBJECTIVITY

Scientific knowledge is objective. It is this objectivity which has helped to distinguish scientific knowledge from all others. It was this quality which served as one of the bases of support for science as a growing enterprise in the Middle Ages in Europe (Ben-David, 1971: 170). During the Enlightenment, the work of science, and most particularly the work of Newton, was revered for this quality of detachment. Science was seen to be independent from authority, "mere" opinion, and vested interest. The claims of knowledge were assessed only through criteria appropriate to such evaluation - only through reference to experience.

This alleged break with authority was also a source of early and continuing hostility to science. The church, for example, was particularly enraged at the abandoning of authority and revelation as final epistemological arbiters. Similarly humanists have viewed this objectivity as malignant and inhuman in its detachment from moral considerations. Indeed one can appreciate this concern and sense of outrage when confronted with the papers of scientists who have worked on military projects. Otto Hahn, noted German chemist, for instance, describes in his autobiography (1970) the course of his long and eventful career in science. He discusses in the same detached tone work on the splitting of the atom, the discovery of new elements, and the World War I work on poison gas. One aspect of this work was the effort to construct a gas which would be so corrosive that it would burn the skin under the gas mask thereby forcing the victim to rip off the mask in pain and succumb to the fumes. Each phase of the work is described with creditable detail, each is seen as an "interesting" problem. (Scientists, being human are inconsistent. In one of life's little whimsies Hahn turns the full bore of his scorn and disgust to those physicists who allowed their work to contribute to the construction of atomic weaponry.)

It is this promiscuous acceptance of each new project as "interesting" which lies at the root of the humanist outrage. Zealous work to improve weaponry motivated by patriotism or even hatred is, by comparison, easy to comprehend. Through the abdication of moral criteria the scientist has, in an important sense, abandoned his humanity. He has become like a machine which kills or cures with the same skill and remoteness.

Philosophically fascinating as this particular debate may be, it is largely irrelevant to the question at hand. The question of the role of objectivity in scientific knowledge is independent from the decision of any scientist regarding moral uses of his work. The epistemological issues of objectivity are of a different order.

In the first place the value of objectivity is maintained as an ideal for the practitioner. The ideal scientist, for the scientist, is one who maintains a dispassionate regard for the facts which overrides all other considerations. Selye, for example, expresses this goal as follows:

> ...a mentality that has control over its numerous prejudices, and is always willing to reconsider them in the face of contrary evidence...The scientist must accept a fact, even if it is contrary to logic...
>
> (1964:44)

It cannot be stressed too emphatically, however, that this represents an ideal. Scientists are encouraged to avoid bias and subjectivity, much as catholics are exhorted to avoid the occasion of sin - with about the same effect. In point of fact, scientists tend to be passionate adherents to their particular ideas and discoveries. This is understandable. The goal of science is discovery. When it appears that this goal has been attained, few can be completely detached in their evaluations of theirlabor, just as few parents are capable of objective analysis of their children.

It is suggested that in the heat of discovery the much vaunted objective detachment of the scientist is likely to give way to feelings which markedly resemble those expressed by Kepler in this often quoted passage:

> What I prophesied two and twenty years ago, as soon as I discovered the five solids among the heavenly orbits - what I firmly believed long before I had seen Ptolemy's Harmonics what I had promised my friends in the title of this book which I named before I was sure of my discovery, what 16 years ago I urged to be sought - that for which I have devoted the best part of my life to astronomical contemplations, for which I joined Tycho Brahe, at least I have brought it to light and realized its truth beyond all my hopes. So now, since 18 months ago the dawn, 3 months ago the proper light of day, and indeed a very few days ago the pure Sun Itself, of the most marvellous contemplation, has shone forth - nothing holds me. I will indulge my sacred fury, I will taunt mankind with the confession that I have stolen the golden vases of the Egyptians to build of them a tabernacle to my God. If you forgive me I shall rejoice; if you are angry I shall bear it; the die is cast, the book is written, whether to be read now or by Posterity I care not. It may have to wait a hundred years for its reader, as God Himself has waited a thousand years for a man to contemplate his work.
>
> (Taylor, 1966:12)

As Taylor states, the usual case is one of "utter committment of the author to passionate belief in his ideas" (1966:18).

Objectivity is not therefore lack of committment to a belief: nor is it necessarily devotion only to fact. Kepler, for example, wished to establish his laws in order to satisfy a mystical-religious desire to relate science to the Pythogorean notion of the music of the spheres.

The committment does not, however, hamper the advance of science, nor does it adulterate scientific knowledge. This is for the simple reason that effective objectivity in science resides not in the person, but in the community. It is not the scientist - discoverer who needs to be objective, but rather the sum total of community reaction. As

Ziman states:

> ...the absolute need to communicate one's findings, and to make them acceptable to other people, determines their intellectual form. Objectivity and logical rationality, the supreme characteristics of the Scientific Attitude, are meaningless for the isolated individual; they imply a strong social context, and the sharing of experience and opinion.
>
> (1968:144)

The true objectivity resides in the independent assessment of new ideas from a number of scientists. Through this assessment critical evidence is amassed and ideas tested. Vested interests thereby "cancel each other out". Scientific knowledge is ultimately objective in the sense that in the long run its validity is determined by the weight of converging evidence. It is not due to any particular virtue on the part of the practitioners. Rather it is the result of the demand that the knowledge be equally accessible to evaluation by any qualified observer.

> Classical science excludes anything emanating from the observer...Thus his fellows are not required to believe in him, nor are they asked to share an intuition difficult to communicate.
>
> (Barzun, 1964:86)

The objectivity, in short, is a function of the public nature of the knowledge.

SUFFICIENT VALIDITY

Science "is not a quest for certainty", J.B. Conant tells us (1951:26). Scientific knowledge is not certain and eternal and is not so regarded by practitioners. Rather, discoveries are considered knowledge whey they are judged to be "sufficiently plausible".

> ...there are no mere facts in science. A scientific fact is one that has been accepted as such by scientific opinion, both on the grounds of the evidence in favour of it, and because it appears sufficiently plausible in view of the current scientific conception of the nature of things.
>
> (Polanyi, 1962:68)

> The concept of 'truth' in science is thus quite special. It implies nothing eternal and absolute but only a high degree of confidence after adequate objective self-testing and self correction.
>
> (Simpson, 1962:11)

> It is not the purpose of science to arrive at a system of absolutely certain, irrevocably true statements. Science is not such a system, and it does not advance towards a state of finality. Science is not identical with what philosophers call knowledge, and it cannot claim to attain truth, nor even probability. But though it can neither knowledge nor truth, the striving for understanding is the strongest motive for scientific discovery.
>
> (Taylor, 1966:1)

Knowledge in science then is that which is sufficiently plausible. Elaborate techniques of verification exist by which such plausibility can be established. Nevertheless the crux of the matter is whether or not the explanation works. Does it fit known cases reasonably well? Is it productive? This is not a standard of truth since ultimately a theory which is both productive and plausible may prove to be false. However this fact does not disturb practitioners of science since concern over truth as such is essentially a philosophical issue, not one that is of interest to science.

AESTHETIC CRITERIA

The final group of standards are aesthetic. They derive directly from the assumptions which form the basis of science and in turn influence not only assessment of knowledge but its verification as well.

There is a strong preference in science for explanations which are simple and mathematically elegant (Medevar, 1967:125).

> It is more important to have beauty in one's equations than to have them fit the experiment.
>
> Dirac
> (Taylor, 1966:38)

> He was convinced that nature was inherently simple, and that apparent complexity reflected lack of knowledge.
>
> Rutherford
> (Oliphant, 1972:26)

This is to say that because one of the assumptions of science is that nature's essence can be revealed in the form of simple mathematical relations, explanations which are simple are preferred. If, in a controversy, two explanations both in apparent accord with the bodies of evidence are competing for recognition, the explanation which is most simple and elegant will receive greatest support.

Thus when the evidence does not express a perfect fit to the elegant formula, it can be said that the fit is embodied in nature but obscured by lack of refinement in measuring techniques. We 'know' that the fit will be gradually unveiled as measurement error is reduced.

CUMULATIVE

All of these criteria (with the possible exception of those dealing with aesthetics) can be best understood with reference to the corporate nature of the scientific endeavor. In the practice of mysticism, the practitioner has no need of any other. His goal is self perfection. Since no one can truly share his knowledge, in the final analysis no one can really assist him in his search. Because he can share no one else's illuminations, their successes can at best serve as an inspiration to him.

The scientific enterprise is based upon different assumptions. Most important of these is the decision to consider as knowledge only that which can be shared. It must be remembered that this is a decision made; in fact we can see the evolution of this concept of knowledge in the history of science as it gradually separates itself from such quasi-mystical activities as alchemy. This corporate character is in fact the only decisive distinguishing characteristic of the scientific enterprise; abandon it ~~and science~~ becomes mysticism at the level of theory or low magic at the level of experiment.

This decision to restrict consideration to that which can be shared and mutually assessed has certain consequences. On the negative side much knowledge is excluded. In particular, increased understanding of the inter-relationship between states of consciousness and the environment, the major concern of high magic, is severely retarded. Such relationships hinge on the cultivation of mental states beyond the control of experimental manipulation. It similarly can be argued that such restriction impedes the full "understanding" of the phenomena, particularly where the subject studied is living.

This restriction does make possible an intellectual enterprise which is cumulative. Because science restricts itself to matters which are accessible to public scrutiny it becomes possible for one man to build upon the works of another. Such a step immediately creates the conditions for rapid expansion of knowledge. Further, the situation makes specialization functional so that any given worker need not have a grasp of the enterprise as a whole but rather will work to extend development in a given area.

Progress occurs not as a result of the perfection of a wise man but as a cumulative product of the work of many, each making a small contribution. In fact, science has become in this sense an extremely democratic enterprise. As Barzun points out:

> It is but one of the great advantages of the scientific method, as Bacon long ago pointed out, that it can raise ordinary ability above that which might be expected of it: science is the democratic technique par excellence. It calls for virtues which can be learned - patience, thoroughness, accuracy. It tests what it does by conventional means - numbers and instruments; it guards against error by the communal sense of sight. The definitions of science, also the result of collective thought, are not supposed to be subject to individual variation, thus to ambiguity. Once understood, they do not slip away. Finally, terms, and techniques devised by one worker are ideally communicable to others.
>
> (1964:75)

The cumulative nature of the enterprise thereby milks the greatest possible contribution from each worker while at the same time protection from protracted error is afforded by the process of public assessment.

> The important fact which emerges from even a superficial study of the recent history of the experimental sciences ...is the existence of an organization of individuals in close communication with each other. Because of the existence of this organization, new ideas spread rapidly, discoveries breed more discoveries, and erroneous observations or illogical notions are on the whole soon

> corrected. The deep significance of this organization is often completely missed by those who talk about science but have not first had experience with it.
>
> (Conant, 1951:17)

In fact, the significance of the cumulative nature of scientific knowledge is such that Conant concludes without such communication there would be no science.

In a cumulative endeavor it is the fate of any discovery to be eventually discarded, as was the case with the plogiston theory, or transcended. A given piece of knowledge will either become commonplace- a subject for text books- or it will be abandoned, and for all except historians, forgotten.

As Oppenheimer states:

> ...what was yesterday an object of study, of interest in its own right becomes today something to be taken for granted, something understood and reliable...a tool for further research and discovery...
>
> (1953:23)

> ...When we find out something new about the natural world this does not supercede what we knew before; it transcends it, and the transcendence takes place because we are in a new domain of experience made accessible only by the full use of prior knowledge.
>
> (1953:21)

Thus the process becomes one of accumulation, much like capitalism. Knowledge is acquired and re-invested in the never ending pursuit of new knowledge. The point of emphasis is the knowledge and not the person. This is very clearly at odds with the total emphasis is the person of the investigation in mysticism. Similarly, when compared with magic, we see science as purging the private elements which predominate in high magic and remain in secondary form in low. It is through this eradication of the private that accumulation of knowledge becomes possible. The public nature of scientific knowledge also provides for a more predictable product; results can be counted upon to follow stable regular patterns independent of the will, intent or emotional state of the practitioner.

XII

THE METHODOLOGY OF SCIENCE

INTRODUCTION

During the 1930's and 1940's two intellectual movements developed which, if successful, would have proved disastrous for the advance of science. The first of these movements was that of the German school of extreme experimentalism. This school:

> ...led by Lenard and Stark, has gone so far as to reject theory altogether as an invention of the Jews and to declare experiment to be the only genuine 'aryan' method of science.
>
> (Born, 1943:1)

The second school, of which Eddington and Milne are proponents, claims:

> that to the mind well trained in mathematics and epistemology the laws of Nature are manifest without appeal to experiment.
>
> (Born, 1943:1)

Both movements are condemned by Born in his address to the Durham Philosophical Society and Pure Science Society (1943). Both have fallen out of favor with the passage of time. The explanation of their lack of success and the condemnation to which they have been subjected is rooted in the essential nature of the method of science. This is the symbiotic relationship between theory and experiment. This relationship is not revealed in an examination of the work of any one practitioner. Neither is it necessarily apparent in an examination of the science of a given era since as Born explains:

> Scanning the history of science we notice a kind of cycle, periods of experimental expansion alternating with periods of theoretical development.
>
> (1943:2)

In the larger picture this intimate union is revealed. The theorist or mathematician describes a "possible world". The experimentalist or observer attempts through testing and measurement to fit this "possible" world with the "real" world.

> The problem of physics is how the actual phenomena, as observed with the help of our sense organs aided by instruments, can be reduced to simple notions which are suited for precise measurement and used for the formulation of quantitative laws.
>
> (Born, 1943:9)

It is the strength of science that even the contributions of those who lie out of the mainstream of growth, or those who are hostile to the tradition can be utilized to ensure continuing progress in the acquisition of knowledge. In this chapter we will consider the two partners in the enterprise of science - theory and observation. We shall then treat the related activity of verification as practiced within science.

THEORY

Science is not the mere accumulation of facts. Indeed such mindless empiricism not only fails to qualify as science but in large part is not even a useful tool of science. As Bronowski so elegantly stated:

> All science is the search for unity in hidden likeness.
>
> (1956:23)

In other words, what we perceive is largely disorder, the task of science is to discover an order hidden in this variety.

> The progress of science is the discovery at each step of a new order which gives unity to what long seemed unlike.
>
> (Bronowski, 1956:26)

George Gaylord Simpson echoes the same thought:

> ...isolated facts...are meaningless. It is only their generalization and their ordering into principles that give them meaning...No one who only gathers data is in a true sense a scientist.
>
> (1962:8)

Bronowski makes this point in a slightly different fashion. John Dalton, he tells us, every day for fifty seven years (he was a man of regular habits!) measured the rainfall and temperature in his locale. This effort produced nothing - no hypotheses, no ideas, no conclusions. Yet Dalton was a scientist who became immortal in connection with his work on atomic theory. Even for a scientist of such power, isolated facts are without value. They merely mirror the disorder which surrounds us. They require theory or conception to give them substance (1973:153).

Theory then is the real essence of science, the source both of its productivity and its beauty. We know that we discover "facts" through observation, refined with instruments and experimental controls. Where does theory come from? Traditional formal views posit two sources of theory; namely induction - reasoning from observation to general principles, and deduction, which is the term designating reasoning from principles to observation. In one case pattern is "discovered" in the data in the other it is "imposed" upon the data.

This is a fairly mechanical view of the process. The scientist is made to seem a passive agent in the proceedings. The implication is that the scientist has an impersonal and detached relationship with his theory; that is, that any scientist confronted with the same data would formulate the same conclusions. The facts are seen as truly speaking for themselves.

At the level of formal discourse this convention is advanced in the literature to a greater extent in the twentieth century than it was formerly when reporting was rather more informal and conversational in approach. The discovery, the ideas, are reported as if they had been achieved through diligent application of either one or both logical approaches. There is a good pragmatic reason for this convention: science, unlike mysticism or magic, treats methods of discovery as irrelevant, while reliability and inter-subjective replicability are crucial. Theories, concepts, discoveries then are presented in an orderly logical fashion so that they lend themselves to verification. The presentation at this level is therefore a shared fiction which is functional to the community.

It must be remembered however that this is indeed a fiction. (Social scientists, being insecure and anxious to be viewed as 'real' scientists unfortunately appear extremely prone to forget this and to proceed as if ideas were achieved in precisely this dessicated fashion. This is probably one reason why there are so few ideas in social science.)

Scientists however apparently recognize the fiction for what it is. Albert Einstein, in an address on the occasion of Max Planck's birthday, stated:

> There is no logical path leading to these laws. They can be reached only by intuition, and this intuition is based on an intellectual love of the objects of experience.
>
> (Taylor, 1966:9)

He stated on another occasion:

> The supreme task of the physicist is to arrive at those universal elementary laws from which the cosmos can be built up by pure deduction. There is no logical path to these laws; only intuition, resting on sympathetic understanding can lead to them...
>
> (Hoffman, 1972:222)

The scientist therefore works to produce ideas *which can be expressed in logical form* and which can be verified against the facts of experience. He does not necessarily *use logic* in order to discover these laws. This confusion surely is the most basic source of misunderstanding in the whole area of the so-called scientific method. As Selye states:

> The impression that scientific research is based on the planned application of logic is largely due to the fact that intuitively directed probings into the unknown are forgotten and only the simplest logical road to success is published and remembered. This *artificial* path is also the only one taught to students. No wonder they come to think of it as the only possible avenue to knowledge.
>
> (1964:265)
> emphasis added

Conant agrees:

> The great working hypotheses in the past have often originated in the minds of the pioneers as a result of mental processes which can best be described by such words as 'inspired guess', 'intuitive hunch' or 'brilliant flash of imagination'. Rarely if ever do they seem to have been the product of a careful exam-

> ination of all the facts and a logical analysis of various ways of formulating a new principle.
>
> (Conant, 1951:48)

On an informal level scientists are naturally pre-occupied with the method of discovery. While induction and deduction are implied to an extent in the process of discovery, that process is seen by scientists to be principally a matter of creative intuition.

> There is a single creative activity which is displayed alike in the arts and in the sciences. It is wrong to think of science as a mechanical record of facts.
>
> (Bronowski, 1956:35)

> Science does not progress only by inductive, analytical knowledge. The imaginative speculations of mind come first, the verification and analytic breakdown come only later. And imagination depends upon a state of emotional and intellectual freedom which makes the mind receptive to the impressions that it receives from the world in its confusing, over powering, but enriching totality.
>
> (Dubos, 1961;122)

> Creation itself is always unconscious; only the verification and exploitation of its products lend themselves to conscious analysis.
>
> (Selye, 1964:48)

An astonishing array of epoch-making scientific discoveries are reported as following from an act of creative intuition. Selye, for example, cites: Loewi's work on nerve functions, Banting's discovery of insulin, Sommeliver's work on child bed fever, Metchinikoff and phagocytosis (the ingestion of foreign materials by cells for defense), Wallace and the theory of evolution, Poincare and the discovery of Fuchian functions, Kekule and the ring structure of benzene (1964: 48-50). Kekule's comments on his discovery are well worth citing in this context:

> But it did not go well, my spirit was with other things. I turned the chair to the fireplace and sank into a deep sleep. The atoms flitted before my eyes. Long rows variously, more closely united; all in movement wriggling and turning like snakes. And see, what was that? One of the snakes seized its own tail and the image whirled scornfully before my eyes. As though from a flash of lightning I awake. I occupied the rest of the night in working out the consequences of the hypothesis ...Let us learn to dream gentlemen.
>
> (Selye, 1964:50)

Scientists, in particular those most concerned with theory are haunted by intuition.[1] However whereas the mystics and high magicians have evolved intensive and detailed schemes which attempt to develop and extend intuition, science has remained innocent of such sophistication. This difference clearly illustrates a profound divergence in style. The mystics and magicians believe that technique to discovery can be both taught and refined. The technique to discovery then is public; the knowledge is not. The knowledge must remain inaccessible, reflecting the assumptions regarding the perversity of sensory data. One therefore checks the technique and trusts perfect technique to produce illumination.

The scientist views intuition as lying beyond rational grasp hence as inappropriate for rational analysis. The knowledge produced is however seen as suitable for such analysis. The knowledge is therefore subject to verification, the techniques of discovery are left to chance, trial and error, grace, luck, or genius.

> Since intuitive mental activity can proceed only behind a screen that protects it from conscious control, a true scientific analysis of intuition is impossible. Conscious intellect cannot reason about things beyond the reach of its perception...
>
> (Selye, 1964:56)

Not withstanding the generally low level of cultivated technique in the area of scientific discovery, there is a powerful and striking similarity between the scientists' ad hoc methods for the maintenance of intuition and those of the mystics and magicians. For example, the magician in preparation for the Great Work will immerse himself totally in his coming ritual so that the ambience of the ceremony completely pervades his mind. The mystic engages in complex and demanding exercises to banish all extraneous thoughts during contemplation. Such techniques find their counterparts in science. Einstein for example, stated:

> In physics, however, I learned to scent out that which was to lead to fundamentals and to turn aside from everything else, from the multitude of things that clutter up the mind and divert it from the essential.
>
> (emphasis added)
> (Hoffman, 1972:8)

The Curies, their daughter reports, would work fourteen hours a day in the lab for weeks on end, then disappear into the woods to reflect upon ideas, returning with fresh insights (Curie, 1938). Pierre Curie stated:

> Oh what a good time it was, in grateful solitude, far from the thousand irritating little things which tortured me in Paris...No, I do not regret my nights in the woods or my days that slipped by alone...I often went off in the evening, up the valley, and came back with a dozen ideas in my head.
>
> (1938:139)

The magicians and mystics both agree that pre-occupation with material things impedes progress to illumination. Evidence from the scientist provides support for this. Einstein and the Curies, for example, were notoriously innocent of both material ambitions and concerns. It would appear that the great insights are associated with those who by interest or design free themselves from worldly ambitions. It seems possible that true creativity cannot co-exist with such concerns. In practice it appears that it does not. This is not to say that scientists must be poor in order to be creative. Rather, creative scientists, like the mystics, magicians, and artists are those who are unconscious of and unperturbed by their material estate except as it interferes with their work.

Madame Curie's life provides a great model of the style of existence of the creative scientist. She had to be reminded to eat and forced to rest throughout her career. As a student, she refused to prepare food for herself, preferring to subsist on crusts of bread and scraps of fruit because such preparation would take precious time from her work (Curie, 1938). Selye's exhortation to the young scientist, demanding of him a renunciation of worldly ambitions echoes the advice given to apprentice monks or magicians throughout the ages (1964:87). Equally similar is his program of concentration:

> A scientist must learn to design his whole way of life in such a manner as to protect himself from these sterilizing influences, or he will not be able to succeed, no matter how great his special talents may be. Creative thinking, is blocked by such factors as: mental and physical exhaustion, petty irritations, noise, worry over domestic or financial matters, depression, anger, or working under pressure.
>
> (Selye, 1964:66)

Finally, insights in all three disciplines are frequently associated with "altered" states of consciousness. This does not mean necessarily that theorists develop their visions as a result of opium dreams. Many of the scientist's insights however seem to be associated with naturally altered consciousness - the dream state, the time just preceding and following sleep in particular receiving frequent mention.

> I find that most scientists have experienced them (intuitive flashes) quite unexpectedly while falling asleep, awakening, or doing something quite unrelated to the problem at hand...On the other hand, physical fatigue, annoyance of any kind, interruptions, and pressure to meet a deadline definitely block intuition.
>
> (Selye, 1964:47)

There are probably very good physiological reasons for these convergences in technique. Advances in biology may well make demonstrable the "scientific" basis of mystical technique. Until then it is interesting to note that both the mystic and scientific theorist are engaged in similar enterprises, the scientist employing in this case the unsophisticated methodology of discovery.

To the mystic the intuitive flash or illumination is an end product: Such flashes are to the scientist merely a small portion of his work. Science is not simply a collection of insights, but the collaboration of intuition with observation. The implications of theory must be examined and extended. Thus a new theory will suggest a whole programme of related development.

A theory essentially represents a shift in vision, a new perspective (Taylor, 1966:24). This shift illuminates the facts in a way not possible using an old frame of reference. We recognize this fact in our speech by referring to dramatic and enlightening changes in vision as 'Copernican shifts' in commemeration of one of the most eventful theoretical illuminations.

Because such shifts in perspective come more readily to the flexible mind; the mind as free as possible from the restrictions of established view and vested interest, innovations in theory are seen to be largely the field of the young in science. It would appear that in general the more abstract the science the more youthful the innovative theorist.

Theoretical innovation carries with it vast amounts of related work - experiment, elaboration, etc. Therefore any given field of science can deal successfully with very few innovators at any particular time. The larger the shift, the more general and encompassing the theory, the greater the attendant labor required. Science has need for comparatively few theorists and even fewer theories. Those which do prove to be of use must be not only valid and productive but topical. Indeed topicality and productivity are of greater significance to the advance of science than correctness.

> ...an incorrect theory may be even more useful than a correct one if it is more fruitful in leading the way to new facts.
>
> (Selye, 1964:288)

Topicality implies several dimensions. Since work does not proceed on all fronts at the same time, the new theory must bear directly on perceived of as problems which are critical at the time. It must serve as an answer to questions which are then being asked. If it is not of current concern, it will be ignored until it becomes so. This was the fate of Mendel's landmark work in genetics which was published in 1866 but ignored for over 30 years until, years after Mendel's death, it was resurrected and recognize.

Lack of topicality can result in the credit for the original discovery being lost when the insight is "discovered" anew. For example, in the seventeenth and eighteenth centuries, combustion was explained by the phlogiston theory. This theory posited that combustion and its effects could be explained by the action of a substance called phlogiston. The concept of this substance was a powerful one. It united a host of previously disconnected data and was therefore productive and durable. Typical reactions were hypothesized to occur as follows:

Calx + phlogiston = metal
(oxide) (from
charcoal)

metal = calx + phlogiston
(heated in air) (oxide) (to the air)

charcoal = phlogiston + fire
(burned) (to the air)

sulphur = phlogiston + sulphuric acid
(phlogisticated (to air) (vitriolic acid)
vitriolic acid
burned)

(Conant, 1951:169)

The theory was also quite false.

Today we credit Lavoisier and indirectly, Priestley, with the "discovery" of the correct principle of combustion in the 1770's. It is interesting to note however that in 1630 a French scientist Jean Rey made the discovery that during the calcination of tin, the calx weighed more than the tin from which it was formed. His explanation of the phenomenon is remarkably close to that of Lavoisier. He stated:

> This increase in weight comes from the air, which in the vessel has been rendered denser, heavier and in some measure, adhesive...air mixes with the calyx,...and becomes attached to its minute particles.
>
> (Conant, 1951:172)

Rey's explanation was lost. The time was not ripe for this discovery.

Similarly, a theory, although accurate, which is formulated before instruments are created which would allow testing is useless for science. The alchemists' idea of transmutation of elements is a classic example of this situation, as is ancient atomic theory.

OBSERVATION

> Concepts without factual content are empty; sense data without concepts are blind. Therefore it is equally necessary to make our concepts sensuous as to make our intuition intelligible.
>
> (Margeneau, 1972:15)

Kant's elegant statement implies that ideas or concepts are but half of the substance of science. The other half is the process of finding fact through observation. It is this process of observation that we will consider in this section.

The ability to observe clearly is one of the marks of the fine scientist. Over and over in biographies of scientists one reads of their precision and skill with regard to observation. Honesty demands that at least one of the more notable exceptions to this rule be cited. Rutherford, known as one of the world's greatest experimental physicists was notoriously clumsy and careless in the laboratory. As one of his co-workers states, he felt that there was no need for precise measurement and observation. "There is always someone, somewhere," he is reported to have said, "without ideas of his own, who will measure that accurately" (Oliphant, 1972:29). Rutherford, however, had the gift of an intuition which saw the heart of the results uncluttered by experimental and technical error. Further, Rutherford had the benefit of a large and capable staff who could do the careful work for him. In this way he was free to indulge his whimsical disdain for precision while at the same time remaining confident about the accuracy of his results. As a generalization the rule still holds therefore that careful observation is the handmaiden of science.

Charles Darwin, for example, says of himself:

> On the favorable side of the balance, I think that I am superior to the common run of men in noticing things which easily escape attention, and in observing them carefully. My industry has been nearly as great as it could have been in observation and collection of facts.
>
> (Selye, 1973:19)

Further, training in careful observation is one of the essential elements of the scientific education, if only implicitly. Such training is particularly emphasized in laboratory instruction where the student learns to "see" the results, to measure precisely.

Observation in science bears strong similarity to mundane observation: in both cases the process of observation begins with sense data. As Planck states, "exact science issues from the experienced sense world" (1949:86). That we are constantly bombarded with sense data scarcely needs stressing. The significant process involved, both for science and the "man in the street" consists in "making sense" of this data - in ordering it into meaningful patterns. Again Max Planck lucidly describes the process:

> (Science)......consists in the task of introducing order and regularity into the wealth of heterogeneous experiences conveyed by the various fields of the sense world... Under closer examination, this task proves to be fully consistent with the task which we are habitually per-

> forming in our lives ever since our earliest infancy, in order to find our way and place in our environment... Scientific reasoning does not differ from ordinary thinking in kind but merely in degree of refinement and accuracy.
>
> (1949:88)
> emphasis added

One might add here that the emphasis is changed in science from "getting on" to understanding. The focus of science is somewhat less pragmatic than that of mundane experience. Nevertheless, the comparison holds and reminds us that there is nothing essentially obscure about the basic processes of any of the systems of knowledge. They only become so in their refinement, ie. when they become distant from everyday experience through specialization. This however is true of any skill or practice constantly improved and developed.

> ...I am arguing that all genuine scientific procedures of thought and argument are essentially the same as those of everyday life, and that their apparent formality and supposed vigor is a result of specialization.
>
> (Ziman, 1968:144)

The fact that order is imposed on sensory data is highly significant. It requires that some factors are highlighted while others recede into the background. By implication some factors or impressions will be ignored altogether. This is consistent with what we can "observe" in our own mundane experience. We do not take full account of all of the information which we receive from our senses, to do so would impede us from our activities. We use what we have learned is significant and ignore the rest.

Similarly in science, all observations are not of equal stature. Some are ignored deliberately, some are simply not seen - they escape detection. The mark of the exceptional observer is his ability to discover; to see what was there all along but to see it as having significance. Observation then has three components: noticing, recognizing, measuring (Selye, 1964:77).

The significance of Pasteur's gift of observation becomes clear in certain phases of his work. His observation of hemihedral facets in crystals was a foundation for his later, more famous, discoveries in the field of formentation.

Duclaux, a junior colleague of Pasteur, states that one other scientist at least made the initial observation: Provostaye, "a conscientious worker without inspiration", had noted the existence of the facets, but had regarded them as insignificant.

One failure to note the significance of hemihedral facets provides us with an interesting insight into observational restriction. Mitscherlich, a scientist of some repute, was occupied in showing the isomorphism of tartrates. Once the existence of the facets was demonstrated, the parallelism upon which his work depended would have been open to serious question. He therefore did not observe these facets (Duclaux, 1973:14).

Pasteur, in this context at least, suffered from no such restriction in observation. His work required recognition of the facets: thus, he saw them, recognized their significance, and ultimately measured them. In this major sense he, rather then the plodding Provostaye, was their discover. As Selye asserts:

> You can't help seeing something that comes into your visual field, but doesn't mean that you recognized it and discovered it.
>
> (1973:78)

The process of observation is often rendered even more complex by a necessarily inferential factor. Frequently, new phenomena are not directly observable, but their existence must be inferred from their indirect effects. Thus some meaning must be attached to these effects, and then the phenomena themselves sought.

In this case Madame Curie was investigating the virgin field of radioactivity using uranium as a source. She had previously discovered that uranium was not the only radioactive substance: thorium exhibited similar properties. She chanced to observe that measurements of the radioactivity of samples of uranium and thorium were much higher than expected. This was the indirect observation which led to the discovery of radium. She hypothesized that the unexplained radiation came from a new and powerfully radioactive element, previously undetected. Four years were then spent in the search for this mysterious and elusive substance.

In the course of this search, a technique had to be invented for the chemical extraction of the element from the pitchblende ore in which it was believed to be found. Several tons of ore were treated, a few kilograms at a time, in order to extract one decigram of pure radium. At this point radium was first "observed": this discovery would not have been made had not indirect observations convinced the Curies of its existence. Observation then, is not simply a matter of perception aided with instruments: conception must accompany it.

This involvement of conception with perception complicates the issue of observation. For as we have seen, Mitscherlich's ability to make accurate and complete observation was hampered by his preconception. We have a cruel paradox then: observation on one hand requires conception, on the other is inhibited by it. The substance of the paradox is revealed in two contrasting approaches to observation; that of Pasteur and that of Raspail.

Pasteur:

> In the field of observation, chance favors only the prepared minds.
>
> (Selye, 1964:78)

Such is clearly the case with Pasteur's work and that of the Curies. The preparedness of mind did not help Mitscherlich.

Raspail:

> Observe much; read little (one reads much better after observing; one observes more freely before reading).
>
> Prejudge nothing, take note of everything.
> Draw much; describe little.
> Draw several different enlargements.
> Compare from every angle.
> Count, measure, and review often.
>
> (Weiner, 1968:81)

The point is, of course, that the practitioner must attempt to be impartial in his observations while using his conceptions as guides to chart the course of what to observe and how to observe it. This is the ideal of science in the field of observation. In practice fallible humans fall considerably short of this ideal. This human imperfection is of course recognized by scientists. The health science does not depend upon any individual measuring up to this ideal.

While the individual practitioner is unlikely to inventory all of the dangers to accuracy, the scientific community as a whole can so do. These dangers include: technician problems such as optical illusion and inaccuracy of instruments as well as personal problems such as bias from preceeding impressions, invention of detail, distraction, fatique (Selye, 1973:79). The saving force in all of this welter of errors is again the community. As Ziman reminds us:

> The conventional description of scientific research concentrates wholly on the significance of one's own experiments and observations. But the material of science is every one's experiments - anyone's experiments.
>
> (1968:33)

Observations are thus honed, in the same manner as theories are honed, through the efforts of independent workers whose results are pooled into a co-operative venture. Inaccuracies are ferreted out; the range of error is limited in such a fashion. What one man does not see, another will.

A practitioner can find renown if, in a given problem, his perceptions are accurate and conceptions appropriate and original in the current state of the discipline. Success for the individual in observation is therefore a combination of preparation, technique, intuition, and luck - the luck of an intuition which is proven correct. Success for the community however is a matter of criticism and co-operation - it is built on the fortune (or misfortune) of the practitioners. In observation, as in theory, it is the fate of any man's work to move from discovery to commonplace to be supplanted.

The final area of concern in the issue of observation again echoes one of theory - topicality. As we noted, a theory can become a vital part of a growing science only if it is in good time. Such is the case for observations as well. An observation revealing a phenomenon which is completely anomalous will be put aside, forgotten until a later more developed science acquires a frame of reference in which the observation can be placed. There can be therefore observations which are made too soon. One striking example of this occurence is cited by Selye (1974:104).

As early as the seventeenth century medical science learned of a pathological condition of the human ovary in which an egg, without fertilization grows into a strange creature or thing consisting mostly of teeth and hair. The German physician Sailtetus named the condition morbus pilaris mirabilis (astonishing hair malady). Martin Luther, no doubt reflecting current beliefs concerning the incubus and sucobus, named it the Offspring of the Devil. Nothing has been made of this discovery since that time. It generated no research, provoked no debate in the scientific literature. This is attributable to the fact that it can be encompassed in no known theoretical system. As Margeneau stated: facts alone teach nothing (1972:13). (A truth regretably more acknowledge in the natural than in the social sciences.)

We can conclude then by re-asserting that observation in science simply refines mundane observation. It is a process of perceiving sense data, often aided by instruments of great precision. To this raw perception is welded an attribution of significance ie. the perception is linked to a conception. Observations in science become landmarks when they are accurate, topical, and productive.

VERIFICATION

Mystics, magicians, and scientists all attempt to refine and perfect their knowledge. In this sense all have special techniques of verification. The mystic, as we have shown, engages in this process through attempts to perfect his technique in contemplation. He refines himself as the instrument of knowledge. The magician, while pursuing the Great Work, similarly follows this course. While engaged in Low Magic, he couples techniques of exegesis with trial and error in order to improve his results. He knows what the end result is to be: the problem lies in designing the appropriate technique - a problem of engineering.

In science there is a shift from private experience to public acquisition. Correspondingly, verification in the eyes of the community becomes essential. This public verification, indeed, is the one essential defining characteristic of science.

> The development of an organized system of (real or supposed) relationships among phenomena is necessary but not sufficient for the definition of science; it is not confined to science. The important distinction between science and those other systematizations is that science is self-testing and self-correcting. The testing and correcting are done by means of observations that can be repeated with essentially the same results by normal persons operating by the same methods with the same approach.
>
> (Simpson, 1962:9)

Such verification is impossible for mysticism and magic, both of which depend upon the mental state of the practitioner for their success.

The public factor of verification also precludes the "mad scientist" phenomenon. Such a creature would fail to have his work judged by public standards and thereby would fail, by definition, to do real science which requires such measures. There is great wisdom in this since any given practitioner has unavoidable weaknesses which if uncorrected, could severely mar the character of the knowledge. Further, collaboration is essential to ensure the orderly development of the field since each individual is limited in ability and productivity.

Special procedures accompany the process of verification. Logical criticism is of course a part of any assessment - any argument proposed must be consistent. The experiment, making use of the powerful concept of control, helps in verification by confronting conjecture with the facts of experience. Instrumentation, making possible extremely sensitive measurement, is developed through the assistance of technology. Throughout, however, it is the existence of independent testers that gives the power to the system - the fact that the perfection of the scheme is in the hands of no single person.

The public character of the enterprise also endows verification with the quality of patience. Knowledge is seen as perpetually tentative, verification as eternal. Increasing sophistication of technique facilitates the continual refining of knowledge. The process can therefore be the work of generations not of single lifetimes.

It seems strange that science should be so preoccupied with error when the system deals with highly trained personnel, each striving to excavate "the truth". They are dealing with the finest most sensitive instruments yet devised. Practitioners are trained in objectivity and accuracy of observation. The framework of the approach seems to be virtually impermeable to error. Is the preoccupation with error justified? What are the sources of error in this most careful of systems?

One of the earliest writers on the subject, Roger Bacon, discusses what he terms the four "impediments of thought". These are seen to apply to science as well as to thought in general. They are: a) over-weight of authority, b) slavery to custom, c) dominance of public opinion, d) the concealment of ignorance by the pretense of knowledge (the sociologist's mortal sin) (Jastrow, 1936:16). Francis Bacon later re-worked these into the famous Four Idols:

> Tribe - "The human understanding is like a false mirror, which receives rays irregularly, distorts and discolors the nature of things by mingling its own nature with it."
>
> Cave - limited outlook based on bigotry or prejudice.
>
> Forum - undue influence of public opinion.
>
> Theatre - ..."Doctrines fostered by authority tradition, vested interests, and to false notions introduced by worlds of their own creation after an unreal and scenic fashion."
>
> (Jastrow, 1936:17)

Jastrow elaborates six sources of error in two categories. First, subjective sources of error are:

> Self - projecting human characteristics upon nature. (Tribe)
>
> Thrill - favoring of the romantic or the dramatic. (Theatre)
>
> Web - spinning out imaginative data. (Theatre)

The "objective" sources of error are:

> Mass - public opinion (Forum)
>
> Mold - class outlook (Cave)
>
> Cult - dogma (Theatre)
>
> — (1936:17)

What he has in essence done then is to separate out the Idol of the Theatre into its three components. It does not represent a significant change from Bacon's presentation.

Jastrow does make one significant error in his discussion. This lies in his insistence that "old" science was riddled with superstition-based error while "new" science is freed from such bias. Such a view is revealed in his comments on the work of Kepler.

> Thus, at one stage, Johann Kepler, still under the bondage of the 'perfection' notion of the circle, tried in turn no less than twenty-two hypotheses to fit the observed positions of Mars into an orbit before he finally hit upon the ellipse; a modern mind, free from the older assumptions would have tried this at once.
>
> (1936:26)

As we have shown, the existence of preconceptions is not a useless impediment but a necessary part of the scientific enterprise. The fact that these conceptions live to be out-moded does not mean that they are superstitious carry-overs but rather testifies to the progressive nature of the enterprise. Conceptions undergo a common life cycle which typically culminates in their becoming strait-jackets to further progress - sources of contraint and error. The old assumptions only appear to us as superstitions because we have advanced beyond them.

Parsheey (Jastrow, 1936:200) advances a conception of three permanent sources of error in science. These are:

> 1. tentative - errors inherent in the scientific method of trial and error, which are consciously regarded as on trial before they are unmasked and discarded.
>
> 2. imaginative - false information and beliefs held by laymen and (scientists) in common simply because the questions involved have not been subjected to any or

adequate technical investigation.

3. scientific - mistaken views...which are based on unreliable, misinterpreted or fraudulent data.

This reveals that there are inevitable sources of error in any scientific development. Error is not some aberration but a natural consequence of development. This insight is furthered by work on the effect on judgement of pre-conception. The classic experiment of Bruner and Postman (1949) reveals clearly that conception influences perception. We saw numerous examples of this in the development of science in the section dealing with observation. Conceptions are necessary for the development of science, but they are doomed to become obsolete. Once they do, they become sources of error.

An additional source of the amplification of error develops out of the hierarchy of science. While the scientific authorities with greatest prestige in the community share obselete conceptions, error will tend to become entrenched. Such was the case with the maintenance of Aristotelian physics in the Middle Ages.

The final source of error lies in the passionate conviction of the scientist. Determination and conviction are essential components of the scientific endeavor. As Selye states:

> The fact is that creative scientists are full of preconceived ideas and passions. They consider certain results likely, others unlikely; they want to prove their pet theories and are very disappointed if they can't...Their prejudices are the most valuable fruits of their experience.
>
> (1964:44)

Conviction can become a source of error when the point of view which the scientist is laboring to establish is unfortunately false.

It is clear that there are abundant sources of error in even the most rigorous practice. The ideal of the scientific approach in response to this reality is simply stated by Bronowski:

> What the human mind makes of the sense date, and thinks about, is always a created thing. The construction is true or false by the test of its behavior. We have constructed the thing from the data; we now deduce how the thing should behave; and if it does not, then our construction was false.
>
> (1956:44)

> ...the place of experience is to test and correct the concept. The test is: will the concept work? Does it give an unforced unity to the experience of men? Does the concept make life more orderly not by edict but by fact?
>
> (1956:55)

The ideal of verification in science is simple and austere. One confronts the construction with experience to see it if conforms. This is done by independent workers to rule out individual bias. On the basis of this evidence the community rules and the construction stands or falls.

In practice things are not so simple. Constructions are not abandoned when they fail to conform to the evidence.

> We can put it down as one of the principles learned from the history of science that a theory is only over-thrown by a better theory, never merely by contradictory facts.
>
> J.B. Conant
> (Selye, 1974:280)
> emphasis added

There are a variety of reasons for this apparent contradiction in purpose. Frequently it is the case that when theory fails to conform with evidence, it is the evidence which is faulted. For example, in the case of relativity theory when experimental results were not clearly in accord with predictions, the theory was not abandoned. As A.M. Taylor stated:

> If scientists were consistently the logical positivists they sometimes believe themselves to be, contradictions between theory and the early experiments might long ago have forced a renunciation of the theory. Fortunately they are too convinced of the inherent rationality of the theory of Relativity to abandon it. Always the theory has been adhered to in the hope that newer measurements would give better agreement; in the meantime the elegant beauty of the theoretical edifice is thought sufficient reason for believing it to be true.
>
> (1966:37)
> (emphasis added)

Dirac, theoretical physicist and Nobel Prize winner whose work included the mathematical theories of anti-matter, the positron, and the negative proton, echoes this criteria of aesthetics.

> It is more important to have beauty in one's equations than to have them fit the experiment...One should not be discouraged if there is not complete agreement between one's work and experiment, because the discrepancy may well be due to minor features that are not properly taken into account.
>
> (Taylor, 1966:38)

When experimental work failed to confirm Lavoisier's equation of fermentation, the experiments were assumed wrong. Results were modified to fit Lavoisier's equation, which was assumed to be correct because of its simplicity. Here we see clearly the influence of underlying assumptions in methodology.

Aesthetic criteria and the demand for simplicity encourage the rejection of negative evidence. Utility is another factor which produces the same result. The most famous triumph of utility over falsifying evidence is the maintenance of both the wave and corpuscle theories of light. Neither conformed to all available evidence, both were useful, so in violation of the canons of logical consistency, both were maintained. Joking recognition of the inconsistency of this maintenance lies in the quip that on Monday, Wednesday, and Friday, light was a wave; on Tuesday, Thursday, and Saturday it was a particle. (On Sunday presumably it rested.)

Defiance of the evidence similarly occurs in defence of a "good idea" in the stages of formulation. When Mendeleev was working out the periodic table he discovered early in his efforts that his predictions did not fit the behavior of the elements. Because many elements had yet to be discovered, his "families" did not fit, their properties according to evidence were incompatible. However, instead of rejecting the idea on the basis of the testimony of experience, Mendeleev modified the evidence. He asserted that his idea was sound; therefore he predicted that new elements existed, as yet undiscovered, which would change the testimony of experience, making it compatible with his theory. He defined the incompatibilities as gaps in knowledge, not as disconfirming evidence (Bronowski, 1973:325). Of course his guess later proved to be correct. Although he went far beyond the facts available at the time, he did not sacrifice an idea in the face of apparent falsification.

Pasteur characterized his own work as following the same kind of pattern:

> If anyone would say to me that in my conclusions I go beyond the facts, I would reply that that is true in this sense that I have taken my stand unreservedly in an order of ideas which, strictly speaking, cannot be irrefutably demonstrated.
>
> (Ducleaux, 1973:72)

Such daring while risky for the scientist who stands to lose much if he is wrong, nevertheless advances science by yards rather than by inches.

The foregoing represent a survey of reasons why scientists choose to ignore in certain cases the testimony of experience. There are also reasons for disagreement and ambiguity because the evidence itself in unclear. Specifically:

> a) possible discrepant phenomena.
> b) data so complex that many explanations of it are possible.
> c) theories probabilistic in nature.
> d) absence of any complete explanation.
>
> (Simpson, 1962:10)

Factors such as these support the view that at any given time, the process of assessing the worth of scientific knowledge is problematic and tentative. It only becomes increasingly sure over the passage of time and with the expenditure of considerable effort. Max Planck expressed his view in a more cynical fashion:

> A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.
>
> (1949:33)

In the face of this, all that can be said of the process of verification is that it does involve the confrontation of theory with experience, but that this confrontation is by no means definitive. The process occurs slowly and takes many detours. It is not bound by rules but rather appears to be episodic or situational in nature. Much of the question of the success of a new piece of knowledge can be determined from the environment of the knowledge - the state of the science at that time, the current problems, issues. It is in relation to this background that new knowledge is assessed. In the final analysis those theories which attain the status of knowledge are those which correspond most closely to the values and assumptions which underlie the scientific enterprise and which prove to be the most productive of further work.

FOOTNOTES

1 Defined here as with Selye: "the unconscious intelligence that leads to knowledge without reason or inferring. It is an immediate apprehension or cognition without rational thought." (1964:47)

XIII

TRANSMISSION OF SCIENTIFIC KNOWLEDGE

INTRODUCTION

As we have shown, the enterprise of science is oriented primarily to the public domain. Accordingly, the practice has taken a social form in its growth. In terms of the control of the nature of knowledge produced, the notion of a scientific community has a cogency not found in magic or mysticism. For while communities of magicians and mystics can be found, their communality bears no direct relationship to the production and verification of knowledge. They take the form rather of associations of people with similar interests. Their primary intellectual significance lies in their role of selecting novices and instructing the novices in the methods of the practice. Such associations are not however necessary for practice. Independent mystics and magicians are numerous. The authenticity of their work is not impaired by virtue of the absence of affiliation.

In science this situation could not occur. Here affiliation with the community forms an integral part of authentic practice. The community is the source of legitimacy for the practitioner as well as for his product. Verification or scrutiny of knowledge is similarly a community function. This is all in accord with an enterprise which is public in intent.

When we examine the issues related to transmission in science, we see the significance of the public focus highlighted. Because the discipline is social, a division of labor becomes possible, even desirable. We will examine in the first section of this chapter the form and function of division of labor in the scientific community. In the second section we will consider the function of the community in the training and control of practitioners. The final section will address the relation between science and government, again an issue of particular significance for an enterprise which is public, and in the case of science, expensive.

TYPES OF SCIENTISTS

The word scientist today conjures up a single powerful image. We see a man, clad in a white lab coat, working alone late into the night. He will be intelligent, thoughtful, and a little eccentric - possibly forgetful, slovenly, or short tempered because his thoughts are in the highest reaches of abstraction, beyond the petty concerns of everyday life. Sinclair Lewis, in a novel cited by Selye as "one of the greatest stimuli to young scientists throughout the world to enter a scientific career" (1964:333), draws upon such pre-conceptions in his portrayal of Professor Gottlieb:

> ...a tall figure, ascetic, self contained, apart. His swart cheeks were gaunt, his nose high-bridged and thin, He did not hurry, like the belated home-bodies. He was unconscious of the world...he moved away muttering to himself.
>
> (1953:9)

This picture bears a remarkable similarity to the popular conception of mystics and magicians, although the extraneous trappings -

the saffron robes, the black cape, the white coats vary. This similarity is a profound one, one which is too little discussed, too little recognized in its significance.

The unitary picture of the scientist obscures the very significant interior division of labor. This omission is compounded by the related error of assuming that a single method rules in science. Scientists come in many varieties, as practitioners hasten to proclaim. Several rather primitive typologies of scientists have been proposed although they are to be considered suggestive rather than definitive.

Barzun (1964:93) proposed that scientists exist in four principle categories. First, there are the theory constructors; men who operate with a new vision. Their thoughts provide the scaffolding for other workers in the field. These men are typically remembered as the great names in science. Second, there are the active experimenters. These men have a genius for laboratory work - they are precise yet creative. Their principal contribution comes from the critical experiment; the piece of scientific virtuosity which contrasts clearly and directly two opposing points of view.

The third type are the tenacious. They tend to be obscure and numerous, contributing to science through persistent and patient work clearing away minor inconsistencies in their fields. The work is typically unexciting and relatively unrewarded but nevertheless important. They are the ants of science. The fourth category are science's grasshoppers. These are the dilettantes; men who are largely unspecialized and unskilled but who are a continuing source of creative ideas. They are unequipped to develop their own ideas which become elaborated by the other types of workers.

Hans Selye (1964:21-29) proposes a more elaborate typology which combines a rather primitive psychology with classification. The typology is presented in three main categories. First are the "doers" in two varieties. The "fact collector" is the mindless empiricist who devotes his career to the uncritical accumulation of new facts. He is a good record keeper, a good observer, but devoid of imagination or critical capacity. The "gadgeteer" is the second type of "doer". He works to improve technique for the sake of technique; however he rarely puts the implements which he devises into proper use. He is somewhat more creative than the "fact finder". Selye recounts a marvellous illustration of the gadgeteer in action (1964:94). A colleague developed a new procedure for the "accurate determination of fecal iron in the rat". He did no experimentation himself, but contented himself with a canvassing of other workers to see if they were involved in work which could benefit from his machine. His career became the peddling of his fecal iron extractor to other unimpressed scientists.

The second category in Selye's typology is the "Thinkers" in four varieties. First, is the "bookworm". This person reads widely, is intelligent and well informed, a good teacher and committee worker. Unfortunately he is awkward in the lab and seldom enters. He is a poor performer, always in preparation, never engaged. The "classifier" began as a child with random collections of things and continues this pattern as an adult. He creates order through classifying but stops at this point - there is no subsequent analysis performed. Apart from this his major flaw lies in the proposal of arrangements which are irrelevant.

The "analysts" form the third category. These were people who as children took apart watches and as adults continue in the search for components and the secrets of construction. The work, like that of the classifier, is significant but incomplete. The final "thinker" is the "synthesist". He represents the highest type of scientist, one who builds upon the work of all of the others to create a new theoretical edifice.

Selye adds a third order - "the Emotionalists" - a collection of the pathological types in science. Significant[1] in this long list of deviants are: first, "the Big Boss". This person strives for success, possibly to compensate for feelings of inferiority. He is an opportunist, a manipulator who does no real science but builds departments and attracts money and staff thereby creating opportunities for others to do science. The "eager beaver" is second on this list. This person is similarly an opportunist. He works compulsively, finding quick solutions to topical problems. He labors, not to satisfy curiosity, but to build a career. The final category of interest here is the "cold fish". This person is the professional skeptic who will accomplish nothing on his own because of his negative outlook. His criticism can nonetheless hone the work of others.

The final typology of workers in science which we will consider is proposed by R.B. Krohn (1971:153-161). He develops three ideal-typical modes of science. First, is the intellectual mode. This type corresponds most closely with the popular conception of the scientist.

He works for personal gratification because of an inner compulsion to seek the truth. He looks for independence in his job situation beyond all other considerations. He would therefore reject promotions which involved administration or other distractions, even though such a rejection would entail loss of prestige or income. Ambitions are framed in terms of theoretical or research problems to be solved, ie. in terms of purely intellectual criteria. Again in Arrowsmith (1953) we find this character portrayed in the figures of Martin and Professor Gottlieb.

The second ideal type is the "professional". This person works for honors and recognition. His aspirations are stated in status rather than in intellectual terms. He therefore readily compromises his intellectual interests for those which can readily be translated into monetary or professional reward. In his search for honors, he places less emphasis on his own intellectual criteria, more on those of the profession. In choice of job situation, he lays greatest stress on the quality and prestige of the staff and department, rather than on the freedom which his situation allows him.

Finally Rohn depicts the "organization man". This person uses his training to build a career in an organization. Science is therefore not his primary orientation. Success is considered in terms of the organization, not in terms of honors achieved within the scientific community or in terms of discoveries made.

These typologies, interesting in themselves, illustrate a profound development in the field of science. In the past only the complete scientist could make substantial contributions to the field. The founding and strengthening of a scientific community however, has created a situation in which a powerful division of labor exists. This system allows for the utilization of the flawed, partial, and insubstantial talents. The mindless empiricist produces new facts which are utilized by theory-builders. Gadgeteers develop techniques which aid the experimenters. Big bosses draw in funds making large enterprises possible.

The shift in emphasis from purely personal development as seen in mysticism to predominately social or public development is again highlighted here. The knowledge is public property - its development a communal enterprise. In such an enterprise labor can be divided according to aptitude. Increased efficiency has been the result.

Some writers, for example Whyte (1957), have expressed fears concerning this division. He sees the spirit of the "Organization" invading the freedom of science, stifling creative development as it goes. Such invasion occurs not only in industry but in academia as well through control of funding by the foundations and change in scale of the universities.

Whyte produces statistics in support of this position which appear to be unassailable. For example, he tells us that "of the 600,000 people engaged in scientific work, it has been estimated that probably no more than 5,000 are free to pick their own problems" (1957:226). He states that less than 4% of the funding for research and development is for "creative work". "The outstanding scientist," Whyte states, "...is almost the direct antithesis of the company-oriented man" (1957:232). Yet the organizations stress compliance with their goals as a top priority. Finally he argues that stress on teamwork stifles creativity. This is the case because the creative act is of necessity the product of individual inspiration. Such inspiration does not thrive in company. Further, the administration of large grants takes the creative scientist away from his work and makes of him a bureaucrat.

These assertions, chilling and gloomy as they are, are happily based upon an essentially faulty view of the discipline. Whyte ignores the existence of the division of labor and its strengths. He pictures scientists as all of the type Krohn would term intellectual - at least before the organization chops them down to fit the Procrustean bed of teamwork. These individuals would, it is true, undoubtably be stifled working in an industrial laboratory doing what Krohn has described as "bound-applied research" - that in which "scientists are hired to work full time on problems related to the purposes of their employing organizations" (1971:193).

Happily, as practitioners recognize, not all scientists are of this variety. The work situation is divided so as to tap a variety of orientations and talents. Further, it would seem that talents become matched to positions at least reasonably well. It is unlikely that there are young Einsteins trapped, unrecognized in the bowels of some industrial site.

Further in this vein, it is ironic that sometimes even the great scientific skills can be inappropriate for the advance of science. When the Pasteur institute was established, Pasteur was appointed director. He operated the institute:

> ...as a set of laboratories where he could pursue his own researches, free of outside disturbances, and with the help of a few associates. For many years he had worked alone. When, later, young men came to join him, they participated in the execution of his work but rarely contributed to the elaboration of his thoughts. In fact, he often left his assistants completely ignorant of the strategy of his investigations, revealing to them only the part essential to the task of the day.
>
> (Duclaux, 1973:vii)

Pasteur's assistants reported similar observations:

> He kept us remote from his thoughts...(we) saw only the exterior, the skeleton of his experiments without any of the thoughts which animated them.
>
> He wanted to be alone in his laboratory, and never spoke of the goal he had in mind...
>
> (Duclaux, 1973:vii)

Pasteur's successor Duclaux, although he did not possess the genius of his master, nevertheless made the institute a more viable unit. He turned it into a center of resources where many scientists could pursue basic research, co-operate and collaborate when it was to their benefit.

The example indicates that the organization man or the administrator is neither a lost nor an unnecessary talent in science. Rather he serves as a crucial link insofar as he facilitates the work of others. The "intellectual" in the wrong situation can be a disaster. Lewis depicts this in his description of the directorship of Professor Gottlieb at the McGurk Institute of Biology.

> Max Gottlieb has ever discoursed to Martin of 'the jests of the gods'. Among these jests Martin had never beheld one so pungent as this whereby the pretentiousness and fussy unimaginativeness which he had detested in Tubbs should have made him a good manager, while the genius of Gottlieb should have made him a feeble tyrant; the jest that the one thing worse than a too managed and

> standardized institution should be one that was not managed and standardized at all.
>
> (1953:320)

The variety of work situations then allows each type of worker to seek his own niche. This makes many of Whyte's fears groundless. The scientists can be made contented. Concerning his fears for science, we find a similar misapprehension of the enterprise influencing his forecasts. While each of us would want maximum freedom to pursue our own thoughts without interruption it is not the case that each of us is capable of producing thoughts worth pursuing. The body of knowledge would not benefit equally from each of our contributions - in this sense science is not democratic and could not be. We are not all Newtons.

Therefore the fact that only a few scientists are so unemcumbered by restrictions is not ominous from the point of view of science provided the selection of such men is carried out in intellectual terms. The fact that there are any investigators who are subsidized to work solely according to their own inspiration is a sign of our high regard for science and our respect for the independence of the scientist. It must be remembered that professional scientists are a new creation. In earlier times the scientist was forced to "moonlight" unless he had independent wealth.

Further, as was shown in an earlier chapter, science can accommodate only a limited number of "discoveries" or theoretical revolutions. The vast majority of scientific work is of the plodding kind, filling in the details, mapping out the logical conclusions. Therefore even in the unlikely event that each scientist were to be funded to "do his own thing", creative revolutions could not be appreciably hastened. The fact of the enterprise would not be changed so long as no tampering with the standards of verification and community control were to be attempted.

Finally this argument ignores the fact that in many disciplines progress can be made only with large grants and the administration which these entail. Highly developed fields such as nuclear physics which have progressed to a dependence on sophisticated technology would be crippled if such funds were to be withdrawn or parcelled out into the small units which Whyte favors. This need for large projects does not entail the conversion of creative scientists into flannel suited bureaucratic robots, rather that alternative talents can be utilized in order to advance a purely scientific endeavor.

DISCIPLINE

> Science confronts the work of one man with that of another and grafts each on each; and it cannot survive without justice and honor and respect between man and man.
>
> (Bronowski, 1956:81)

At first glance one would believe science doomed if its survival depended on the cultivation of such qualities. In other walks of life cheating, lying, stealing rear their heads wherever rewards are offered. Yet science has survived, without significant adulteration of its values or disruption of its knowledge. Furthermore, it has endured without coercion thereby forming one of the true international communities.

In small part this success can be attributed to the honest nature of the practitioners. That scientists love truth is one of the most often quoted descriptions embedded in the popular belief and, not surprisingly, forming a strong part of the creed of practising scientists. Science itself is a search for a kind of truth. Deceit is the cardinal sin in such a system.

Yet it is naive to assume that such prodigious virtue arises and is maintained only as a result of the predispositions of its practitioners. Price grasps part of the answer when he notes that science is "remarkably effective" in training the virtues of honesty and objectivity (1968:140). The training, with its emphasis on precision undoubtably aids in the growth of "moral precision" at least insofar as this directly relates to the enterprise. The presence of role models similarly assists in this development. Thus honesty can be seen as one of the attributes learned during apprenticeship.

Again, however this answer seems inadequate to explain the comparative absence of deceit in an ambition ridden and highly competitive calling. Two major factors are operative here enforcing honesty - the scientific community and the public nature of scientific knowledge. Working as a unity, they effectively remove temptation by making the possibility of successful deception remote.

An example will make this joint influence clear. A newly graduate Ph.D. wishes to make a brilliant career. He embarks upon a series of experiments only to discover after a year's labor that the results are useless. They advance no theory, clarify no issue, reveal no new fact. Desolate, he contemplates the creation of results which would be of professional use. He will in all probability realize that such a course of action is futile. He will realize that results which are provocative or unexpected meet two fates. They are either ignored (Polanyi, 1962) or they are scrutinized directly or in the course of related work (Barnes, 1972:279). In the first case they will be of no positive aid and in the second, the fraud being easily uncovered, there will be only negative consequences. If our man chose to forge results which were entirely conventional and unsurprising, he would fail to achieve his end since surprise and originality count heavily in the distribution of scientific reward. So great is the emphasis upon precision and honesty that even mistakes, ie. actual oversights or failures in technique can be negative in their consequences. Such a situation is discussed in Snow's novel of science The Search (1958). At best, one achieves a reputation as a slipshod careless practitioner; at worst, one is considered to be dishonest. In either event, the manner of operation of community standards ensures that dishonesty bears no likely rewards, while clear and heavy penalties are maintained for deviance.

Such a system of control is implicit in the shift from man to corpus of knowledge. Both magic and mysticism attempt to produce "wise men". These men have knowledge, powers, insights, and experiences which are inaccessible to the community, and further which cannot be adequately communicated to the community or to any portion thereof. Thus the knowledge of these masters cannot be independently assessed for it is godlike in its remoteness from community standards and experience.

The shift from emphasis on seer to emphasis on knowledge which is completed in science changes this entirely. In science no practitioner, not an

Einstein, not a Newton, is considered a wise man in this sense; ie. someone to be judged for what he is not what he produces. It is always the product, always the knowledge which is assessed and rewarded, and this knowledge is only considered such when it is accessible to review. This is the deeper implication behind Selye' distinction between genius and madness.

> ...the most original idea is worthless if we cannot grasp and fix its meaning in terms of conscious intellect. Even the most original idea conceived in the mad' man's imagination or the sane person's dream is of no use, because it cannot thus be translated. Genius must not only be able to dream, but also to articulate these dreams.
>
> (1964:67)

This is the crux of the scientific requirement of knowledge.

The professionalization of the enterprise exerts another disciplinary force. In order for progress to take place in a steady fashion results must be published promptly. Theories and findings which are suppressed by scientists retard the work of others in the field. In the past instances of at least temporary suppression of work by its author have been documented. Complete suppression of valuable work could well have occurred undiscovered by posterity.

Although his work on optics was completed in the 1660's, Newton refrained from completely publishing his book on the subject until 1704. He stated his reasons in a letter to Leibniz:

> I was so persecuted with discussions arising from the publication of my theory of light that I blamed my own imprudence for parting with so substantial a blessing as my quiet to run after a shadow.
>
> (Bronowski, 1973:226)

Further he refrained from publishing his work on gravitation later expressed in the world shaking Principia for a full twenty years. In this case his reasons for suppression are less clear.

Darwin, after his return from his voyage on the Beagle, worked out the theory of evolution from 1838-1844. Upon completion, the work was deposited with a sum of money and instructions that it be published on his death. Speculation has it that he wished the work published post-humously since he realized the storm of controversy which it would produce and did not wish to be troubled (Bronowski, 1973:306). Speculation aside, it was not until 1859, twenty years after the theory was drafted, that he published Origin of Species. The immediate incentive for publication at that time was the discovery of parallel work by Wallace.

Such disinclination to publish must be discouraged with vigor if science is to progress. Professionalization serves this function. If one is to have work recognized as science, one must be accepted as a part of the scientific community. Such acceptance is dependent upon appropriate credentials. Continued participation is contingent upon employment and recognition. Without these, further involvement is impossible. Funding accompanies membership in the community. This in turn depends, in part, on publication. Scientists cannot refrain from publishing and continue to be scientists.

This insistence on publication is not without dangers. In particular, when applied indiscriminately, it favors trivial, safe work which can be completed with haste. Correspondingly, it erects barricades in the path of slow, careful, and reflective work. As a standard, it must be used with discretion but such is the case with any standard. It has a function to fulfill, one which is seldom acknowledged - not a way of facilitating decisions regarding promotion; but a device to ensure that the body of knowledge is enhanced.

TRAINING

As the scientific enterprise has grown increasingly more organized and rationalized, the process of training has changed correspondingly. Goran (1974:85) points out, for instance, that science was once "the province of amateurs". That is to say, people who engaged in science typically had no formal training in the enterprise, and were not possessed of any sort of certification. They were usually wealthy enough to be exempt from the necessity of labor for substenance or those whose principal occupation was not science. In fact, Ben-David (1971) demonstrates that the social role of scientist itself is a recent invention. Without such a role there can be no clear notion of what a scientist is or does. In addition, as we have seen, the absence of such a role hinders the advance of scientific knowledge.

As the social development of science has progressed, the conception of scientist has changed. Accompanying this has been a growing emphasis upon dedication. Single-minded dedication to the pursuit of science is seen by both practitioners and laymen alike as one of the hallmarks of the profession. This notion of single-mindedness is illustrated in Selye's very personal account of science (1964). In this work he characterizes as one of the pathological or deviant types of scientist, the "goody-goody" who "after he...married,...became a conscientious bread-winner, but his work as a scientist suffers severely from his sincere desire to give his wife the attention she deserves" (1964:28). He later speaks of research as such in all absorbing passion that many eminent practitioners: "never read anything but technical texts...do not even read the daily newspaper...read nothing but detective stories" (1964:332). This sort of general cultural and social illiteracy, which would be a source of condemnation in those in other callings, is seen as a virtual necessity, a badge of eminence in science. Indeed, the practitioner who has ample time for family, or other interests, or for political engagedness is seen to be an incomplete scientist.

Accompanying this expectation of devotion has been an increased emphasis on formal training. The evolution of the procedures of training scientists is most thoroughly treated in Ben-David's The Scientist's Role in Society (1971). For a complete discussion of this evolution the reader is referred to his work. For our purposes it is sufficient to note that the production of scientists has been allocated to the universities, and specifically to the graduate schools.

This training is of special interest in terms of its omissions. These highlight the inadequacy of the conception of science presented in traditional philosophy of science. As Ziman, a theoretical physicist, demonstrates, scientific training places no stress on conventional notions of a "scientific method" (1968). Students of science, in particular those in the so-called "hard sciences", do not as a rule devote themselves to the study of metaphysics, the philosophy of science, formal logic, or the "scientific method" (1968:7). This singular neglect is easily explicable. According to the practitioners, the model of the philosophy of science bears only a fleeting resemblance to the actual work of science:

Schilling states this view very strongly:

> Among the obstacles to scientific progress a high place must certainly be assigned to the analysis of scientific procedure which logic has provided...has freely re-arranged the actual procedure in accordance with its prejudices, for the order of discovery there has been substituted an order of proof...It is not too much to say that the more deference men of science have paid to logic, the worse it has been for the scientific value of their reasoning...Fortunately for the world, however, the great men of science have usually been kept in salutary ignorance of the logical tradition.
>
> (Selye, 1964:265)

Because scientists do not follow a rigorous and logical method in making their discoveries, they do not study such a method in the course of their training. Ziman carries this thought farther. Scientists, he argues, have no precise conception of science but instead operate with a "rough and ready conventional wisdom" (1968:6).

What then does such training stress? First and foremost it provides the requisite background knowledge. The student is instructed in current theory, experimentation, and procedures. This knowledge is the cumulative product of scientific endeavor. Provided with this background, the student can enter into the scientific discourse at the same level as the initiated. It is in this phase of training that the cumulative nature of the enterprise is revealed in all of its strength. The newly initiated practitioner is spared the necessity of extensive re-discovery and can instead devote his attention to the frontiers of scientific knowledge. Such a luxury is denied the practitioners of magic and mysticism, who must discover their own powers at every step replicating what has gone before.

The training provides significant rôle models - leading figures in science who serve as a basis for aspiration and ambition (Glaser, 1964). These role models have a dual effect. On the one hand they create and foster ambition while embodying the scientific virtues, while on the other they produce in some practitioners what Glaser terms a "crisis of comparative failure" (1964:129). This crisis is the perception of failure on the part of scientists whose careers are objectively successful but who are denied the "breakthrough discoveries". Since such discoveries are rare and since relatively few can be assimilated into the corpus of science at a given time, it is clear that the majority of practitioners must cope with this crisis to some extent.

Through the provision of role models and through active apprenticeship the scientist learns the social role of his craft. He learns the appropriate norms which govern his professional behavior, in particular the emphasis on honest reporting of findings. This learning is a true apprenticeship. It is based at the graduate level on work done with a senior researcher, thereby allowing the junior to acquire the necessary techniques and skills through example. As Selye states:

> Whatever little teaching is possible must be done by taking the novice by the hand and making him walk beside you. We learn both the practice and the philosophy of the biologist's life as we go along, by our own experience and by watching our masters.
>
> (1964:264)

Polanyi echoes this belief:

> ...the methods of scientific inquiry cannot be explicitly formulated and hence can be transmitted only in the same way as an art, by the affiliation of apprentices to a master.
>
> (1962:69)

Paradoxically, the enterprise which is famed for its method does not formally train its practitioners in the use of this method. The training has three other important functions. First, in order to maintain and enhance the cumulative nature of science it is essential that new recruits be acquainted with what has gone before. No time should be sacrificed in re-discovering the wheel. Intensive exposure to the literature of science satisfies this requirement efficiently.

Second, the training provides a certification. Such authorization of the practitioner as competent to enter the discourse was unnecessary in the days when scientists were few and could communicate more directly and personally. Such direct knowledge of credentials and abilities is increasingly rare as science grows and practitioners multiply. The completion of the Ph.D. is now generally seen as an admission to the community (Ziman, 1968:63). A Ph.D. is considered to be learned in his discipline, aware of the professional language and the orthodoxy of science. He is therefore entitled to be heard.

This sort of certification is essential since scientists must rely on the work of others if they are to make progress. While there is recognition of the fact that all work is open to be checked and replicated, in fact all work is not so scrutinized. Barnes, for example, explains:

> ...limited norms of scepticism exist: critical attention is directed to work anomalous with respect to a paradigm, results produced by a recently developed technique, and experiments either charged with technical inadequacy or unavoidably unreliable due to external constraints or dependence on measures near a technical threshold. Results produced by practitioners reputed to be tech-

> nically unreliable are given a similarly guarded reception whereas other work is likely to be accepted routinely, especially if it emanates from a highly reputable source.
>
> (1972:279)

Because much work must be accepted on faith in the competence of the practitioner, standards for authorizing those who are to be entitled to a legitimate voice are essential. As Polanyi states:

> Only discipline imposed by an effective scientific opinion can prevent the adulteration of science by cranks and dabblers. In parts of the world where no sound and authoritative scientific opinion is established, research stagnates for lack of stimulus, while unsound reputations grow up based on common achievements or mere empty boasts.
>
> (1962:61)

Thus with the shift from personal to community standards comes a corresponding shift from self evaluation to public legitimation. When knowledge is considered to rest ultimately upon personal experience and judgement; the decision as to its existence is personal. Such a system produces wise men but not necessarily wisdom. Science has stressed the possession of knowledge by a community: that knowledge is by definition public. Therefore objective standards which evaluate the knowledge necessarily evolve. By extension, this necessitates strict scrutiny of the practitioner. Only where knowledge is public property is such scrutiny essential. Only where knowledge is public property is such scrutiny possible.

What this means is that if a cab driver had devised the correct model for DNA in advance of the work of Watson-Crick, his work would be lost. He would receive no credit for his "discovery". It is virtually certain that his work would not be published in a recognized scientific journal. Because the work would be barred from the channels of communication, for all practical purposes it would not exist. In the organization of contemporary science only those certified have a voice in the forum; hence only they can contribute to the body of scientific knowledge. In this manner the community sacrifices, and justifiably so, ideas, hypotheses, and theories of possible merit for the sake of greater efficiency. The need for confidence in work done takes precedence over the need for ideas. This is particularly true since it appears a common belief, whose veracity is attested to by the frequency of multiple discovery, that ideas arrive when their time has come; hence they are not a distinct product of their creator in the manner of a work of art. As Galton is reputed to have said: "When the apples are ripe, they fall" (Price, 1963:66).

The final function of training is related to the site of education and not to its content. Simple admission to the community will not ensure in and of itself rapid progress in the scientific hierarchy. The novice must attract the attention of his peers and, in the absence of a breakthrough discovery, the site of training aids in such a process. That is, association with a leading figure in the form of graduate work completed under his supervision, joint research conducted, papers co-authored, brings an early spotlight. Presence at a famous graduate school magnifies this effect. Such patronage therefore assists the novice in the development of a substantial career with its attendant security and reward. Those in such a position have greater opportunity for significant discovery since their positions tend to have greater emphasis on research rather than teaching or other distracting duties: further they will have greater freedom in choice of problem and access to necessary instrumentation, assistants, etc. To the extent to which such patronage is based upon merit it has obvious advantages for the community in the form of fostering talent. The attendent dangers of squelching talent when the system works as a self-fulfilling prophecy are equally clear.

SCIENCE AND GOVERNMENT

The contemporary relationship between science and government is a complex and problematic one. Science has always required patrons of some sort since it typically produces no immediately saleable commodities. Since the second World War however, the cost of much of the ongoing research has become so great that only government and the largest of corporations can afford to serve in this capacity (Price, 1968:35).

This situation has had two consequences for science. The first is the necessity for developing a new kind of scientist - the statesman or politico, a person who can lobby effectively for funds to subsidize the scientific endeavor. As Yaron Ezrahi states:

> The new political condition of science has meant that the ability of science to grow and flourish depends no longer merely on the free and successful use of intellectual resources, but also on its adaptibility to political action and its capacity to convert its unique resources into effective means of political influence.
>
> (1972:213)

A prototype of this kind of practitioner is Vannevar Bush whose report Science, the Endless Frontier (1945) was instrumental in forging

American policy concerning research. He discusses his career as scientific lobbyist and organizer in the memoirs entitled Pieces of Action (1970).

This development is an ironic one for scientists who have prided themselves on presenting an apolitical and cosmopolitan face to the world. Increasingly, the success of an essentially apolitical activity hinges upon the actions and attitudes of political officials and those who would manipulate them. Growth and even survival depends directly on those whose principle affiliations need not be with the scientific community and with those whose intellectual contributions to the discipline are minimal.

The independence of a freedom-loving practice receives another blow from this situation of dependence. That is in the fear that funding, in particular government funding, comes "with strings" (Price, 1968:12). Himsworth, a medical researcher and administrator, argues that this is the dilemma of modern science. Namely, that there exists an antipathy of creative workers to organization and constraint. Although the scientists fear that their work will be suppressed, stifled or altered in some manner, they nevertheless require these funds in order to continue (1970:2). The scientists therefore lose their feeling of independence and autonomy (and possibly their actual autonomy). Further, they are forced to cultivate non-scientific roles and skills in order to compete for scarce resources in the marketplace of government funding.

As serious as the situation is for science, it poses problems equally grave for government, and, by extension, for the public.

As Price outlines in his work The Scientific Estate (1968), this new "scientific revolution" has had clear consequences for government, some of them ominous. In particular, he argues that this "revolution" has contributed to a merging of public and private sectors. One example of such merging occurs when new enterprise arises as the direct result of technical innovations which were developed in government funded projects. Research thereby serves as a link between government and industry (1968:15).

The increased complexity and high level of abstraction found in contemporary science (excluding social science) has other consequences for government. The key ideas for new policy are accessible only to experts. Policy, accordingly, is initiated by these experts not by officials. Under such circumstances Price claims that the notion of responsibility in government becomes eroded (1968:15).

Our culture has not been noted for stressing the value of pure knowledge. Yet the scientists, surprisingly, have been extremely successful in lobbying for public support of their researches. What has been the basis of this success?

The heart of the problem lies in the justifications of so-called pure or basic research. Applied research, being immediately directed toward practical or technical issues, "sells" itself. Basic science can be justified in either of two ways, as an end in itself or as a means to another valued end. Scientists have made excellent use of this second route. They have argued that basic research lies at the heart of economic prosperity, military prowess, and the conquest of human misery. They point to the examples of modern technology and nuclear weaponry as illustrations for this fact. Pure research, they argue, is the root of all later developments. The nature of later applications can neither be predicted nor controlled therefore in order to achieve maximum development, maximum amounts of basic research must be supported.

The success of the pure scientists in lobbying, we believe, is due to skillful manipulation of popular values and fears. The fear of war and military inadequacy is exploited as is the desire for comfort and the fear of poverty, illness, and death. In other words, basic science is sold as a necessary evil. It is part of the package of technology and applied science. Basic science is presented as what Weinberg terms an "overhead charge on applied science and technology" (1964:12).

> ...that purest basic science be viewed as an overhead charge on the society's entire technical enterprise - a burden that is assessed on the whole activity because, in a general and indirect sort of way, such basic science is expected eventually to contribute to the technological system as a whole.
>
> (1964:12)

There is a grain of truth in such an argument. Rutherford, for example, was severely criticized by other physicists and by authorities for engaging in impractical research while would have no conceivable payoff to industry, government, or society (Oliphant, 1972:137). In January, 1945, Michael Polanyi was asked about the possibility of technical uses of Einstein's relativity and he could not name any. He argues further that at the time of formulation, such forecasting was beyond even Einstein himself.

> ...it is obvious that Einstein could not possibly take these future consequences into account when he started on the problem which led to the discovery of relativity.
>
> (1962:62)

The point here is not to imply the incompetence of individual practitioners. Rather it is to underline the difficulty of prediction even for those experts intimately involved in the area in question. If such prediction is difficult for these people, it is surely impossible for the layman. Therefore there is a sense in which it is impossible to forecast in advance of the actual work which areas of basic inquiry are likely to be productive of insights capable of practical application.

While these arguments have undoubtably been effective, and, as we have seen, have at least a limited truth, they are nonetheless flawed. Toulmin (1966) points this out. First, as a generalization, the unpredictability doctrine is untrue (1966:160). While no one can confidently predict the subsequent utility of any given discovery, general kinds of discriminations can be made. It is a similar situation to that of the insurance industry. One cannot predict with certainty the likelihood of any given automobile being involved in an accident in a given year. Nevertheless, one can predict, with sufficient accuracy to allow for a profit, the likelihood of a class of cars (or drivers) being so involved. One can adjust rates accordingly. So too could the funding of basic research be adjusted. Further, Toulmin asserts:

> ...there is no reason to suppose that the scale of likely utility will always coincide with the scale of likely intellectual value. Indeed, there is some reason to suppose that they will often diverge.
>
> (1966:16)

The interests of scientists therefore can be expected to diverge from those of funders. This implies that funders require an articulated set of criteria upon which to base decisions which is independent from those of scientists.

The second sort of justification given for extensive funding of basic science is the "high culture" argument. In such a view pure science is seen to be analogous to fine art. Weinberg, for example, draws the parallels as follows: both represent intense, transcendental human experience, both produce results which are immortal, both embody truth, although of different varieties, both enrich life (1964:7). Pure science therefore has claim for support in the same manner as symphony orchestras and opera companies. Further, Weinberg assures us that unlike the arts, science has the added virtue of public verification. We can be confident that nonsense has been banished from science. This sadly is not the case in the arts where no universal standards exist (1964:7). The only drawback in this view is that pure science appeals to and can be appreciated by only a tiny number of experts whereas art is more democratic in its following. This condition is rectified in the dreams of those such as Soviet chemist N.N. Semenov (1964) who foresees a future where enlightened education will make every man a scientist. Alas such dreams are too far distant to be of consolation to either the scientist struggling for funds or the official with a tight hand on government purse-strings.

One parallel which is ignored in this regard casts a slightly different light on the question of public support. This is the fact that the public in both cases would appear to prefer "low" culture to "high". Witness the success of such works as the Bermuda

Triangle and Chariots of the Gods. In science, the public clearly loves the carefree adventurous approach in preference to the somewhat pedestrian caution exemplified in the scientific journal. In the case of the fine arts we see that entertainment in the order of Kojack, The Tonight Show, and Let's Make A Deal survive and indeed flourish in the absence of government funding while opera companies and symphony orchestras limp along in a state of perpetual need. One suspects that if the public had any direct voice in such matters, neither pure science nor the fine arts would receive appreciable levels of direct support.

There is one divergence which further complicates the argument. Artists historically have shown a curious tenacity of will. Experience teaches that we can comfortably ignore them, confident in the knowledge that they will manage to eek out some sort of existence and continue to create. We will inherit the products of their labor to turn into movies or comic books or industrial design without the expenditure of any public monies. This is one case of having one's cake and eating it too.

The situation of science is quite different. While individual scientists undoubtably evince the same kind of persistent determination found in the arts, they have not the luxury of the independence to work and starve. Contemporary science, especially certain branches of the enterprise, cannot be performed without large sums of money. Our attitudes toward support therefore must be directly confronted. There can be no smug avoidance here as there has been with art. Unlike the situation of art, if we want science we will have to pay for it and if we choose not to pay we will have neither science nor its by-products.

The argument to high culture, being somewhat naive, is unlikely to be effective. Toulmin (1966) presents one final argument in support of basic research which is practically speaking, more effective. In this view, scientific activity is seen as tertiary industry and can therefore be supported as such. Research facilities provide employment and an influx of money to their communities. Their establishment should consequently be looked upon as a source of prosperity and not as a drain on community resources. This conception receives support, Toulmin argues, by the fact that communities actively lobby for new research facilities (1966:167). Publications in such journals as International Science and Technology give advice to communities or organizations on the most effective strategies for the acquisition of such facilities (1968:168). It would seem that to the concerned parties, this perspective is persuasive.

Such controversy is becoming more acute since it would appear that the golden years of funding are ending (TIME, May 3, 1976:48). Some commentators voice the fear that science will soon be considered a luxury.

> ...will society continue to subsidize the work of men whose prime interests are intellectual, not technological, and whose final loyalty is in many cases to some ideal supernatural community of scholars, rather than to any individual corporation or country?
>
> (Toulmin, 1966:156)

> ...we all hope that the present competitions for the most powerful military posture will become unnecessary soon...Quite likely, not only will the present unquestioning support of science cease then; it will be

> replaced by distrust and even unpopularity...What will be the role of science then, where the scientist will be no longer a source of power of the government ... it would be most pitiful if mankind turned away from science...
>
> (Wigner, 1963)

Choices must be made. To this end, several proposals designating criteria for allocation of funds have been devised. Polanyi argues that decisions regarding areas of support and development must come from within the community of science.

> Any attempt at guiding scientific research towards a purpose other than its own is an attempt to deflect it from the advancement of science...It is conceivable that we may come to abhor the progress of science, and stop all scientific research or at least whole branches of is, as the Soviets stopped research in genetics for 25 years. You can kill or mutilate the advance of science, you cannot shape it. For it can advance only by essentially unpredictable steps, pursuing problems of its own, and the practical benefits of these advances will be incidental and hence doubly unpredictable.
>
> (1962:62)

John Maddox supports this basic position. Arguing that decision making is a basic component of all science; that scientists make priority decisions as part of their normal course of affairs, he asserts that:

> ...this demands that major decisions about the commitment of large sums of public money to the development of particular scientific ends should be regarded as the responsibility of the scientific community as a whole, so that decisions are not made without the most searching technical inquiry by people intimately engaged on the work concerned.
>
> (1964:158)

Note that Mr. Maddox stresses the need for inquiry by the parties concerned, not inquiry regarding these persons. In order to facilitate this development he urges the strengthening of debate within the scientific community (1964:150).

Naturally, scientists wish to maintain maximum control over their own discipline and they dire threaten dire consequences if this control was lost. However the prospects of complete authority over substantial amounts of public expenditure being in the hands of private citizens lends credence to Price's fears.

Two additional proposals attempt to balance scientific needs with the demands for accountability. Carter (1963) wishes to employ utiliterian criteria in decision making. For him the:

> ...fundamental significance of scientific research... in its long term contribution to the stock of productive knowledge; the 'intellectual curiosity' of the natural scientist is an object of disinterested patronage alone, a sideline into which - if the nation so decides - surplus resources may be diverted at the expense of the flow of material wealth.
>
> (Toulmin, 1964:348)

Thus the control over research funding should be placed squarely in the hands of government. Emphasis would be given to applied and technological work. Pure science, in such a scheme would be funded as a luxury or frill.

Weinberg (1963) attempts to modify this extreme stance. He suggests that, in attempting to assess priorities, we look first to the body of literature in the discipline.

> The existence of a healthy, viable scientific literature in itself helps assure society that the science it supports is valid and deserving of support. This is a most important, though, little recognized social function of the scientific literature.
>
> (1963:162)

There are then two "internal criteria". In applying these we will seek counsel from within the discipline. First, we will ask of practitioners: "is the field ready for exploitation?" As we have shown at length, this is indeed a crucial question since topicality serves as an ultimate constraint in science. Second, we will ask, "are the practitioners of sufficient competence?" Talent is a scarce resource, scarcer even than money. Particularly in developing countries, it may be the case that there exists an insufficient supply of trained and talented individuals working in this area to justify additional expenses (1963:163).

The external criteria alone are insufficient gauges, Weinberg argues. Perspective from without is also required. To this end he suggests three external criteria by which to judge merit (1963:164). They are: technological merit - the potential pay-off in applied value likely, scientific merit - the relevance of the pursuit to broad areas of science, social merit - relevance to human welfare and values. The application of such criteria, he argues, will allow us to patronize science while at the same time making the most rational possible use of our economic resources.

A mutually satisfactory resolution to the question of the relation between science and the public, or more precisely, the public purse, has not been attained. In the absence of such a resolution science as an enterprise remains vulnerable to injury and even destruction. The public nature of the discipline which facilitates verification and the accumulation of knowledge permits this vulnerability. As the enterprise has grown, the division of labor has increased as has the demand for facilities and finances. This growth has produced prodigious intellectual productivity but this productivity rests upon a community of great delicacy. It is therefore not an unmixed blessing for science. The power has a price; that price is loss of independence.

FOOTNOTES

[1] Others include: the narcissist, the aggressive arguer, the credit shark, the saint, pseudo-saint and the goody-goody.

XIV

CONCLUSIONS

We approach the end of our investigation. What we must do is to tie together the strands of our argument and to explore some possible implications arising from the deliberations. Accordingly this chapter will be ordered into four sections. The first will summarize the essential features which we discovered as characteristic of each system. The second section is integrative. Herein we will consider the overlap between systems, in particular the pervasive character of the mystical experience in the search for knowledge.

The benefits of science are fairly obvious to the denizen of contemporary society. The satisfications inherent in mysticism and magic are less clear. The third section of this chapter will therefore briefly explore the intrinsic satisfactions of these approaches to knowledge and to help account for their continued popularity in this "Age of Science". Finally we will explore the issue of societal reactions to the three systems. The particular dimension of reaction which we will consider is that of control. Here we will discuss the problems of social control posed by each system together with possible strategies to resolve these problems.

SUMMARY

Mysticism

As our analysis demonstrates, mysticism is a prime exemplification of a private conception of knowledge. The mystic assumes, as do all knowledge seekers, that there is an order to be discovered in the universe. He assumes in addition that we hunger for an awareness, an appreciation of this order. In the mystical terms of reference the attainment of this awareness constitutes for the knower partaking in the sublime. As such it is a goal well worth the struggle.

All knowledge seekers recognize the flaws inherent in the senses. The mystic carries this recognition to an extreme. He argues that because the order which he seeks to grasp is without flaw, no imperfect instrument can provide its measure. The mystic therefore considers the senses as impediments to the attainment of the knowledge which he seeks. Far from using them as a source of information, he attempts to blot them out: to stop temporarily both the stream of consciousness and sensory input.

The instrument or faculty which is employed in this search is mind. The mind of the practitioner is his only tool and repository since only mind, which partakes of sublime order and perfection is thought capable of comprehending this order. In consequence the method of mysticism focuses on manipulation of the person of the practitioner. His intent is to so discipline his body and consciousness as to eradicate all but the highest component of consciousness. When this feat has been accomplished he will "see" for the first time; he will achieve enlightenment.

The nature of this enlightenment is as mysterious and elusive as is its method of accomplishment. The mystical enlightenment does not convey knowledge which is logical, propositional, or even conceptual in form. The knowledge can be translated only imperfectly into communicable terms; its total impact and significance is completely grasped only by the mystic himself. The one clear finding concerning the nature of mystic knowledge is that it conveys a strong sense of certainty to the practitioner. He 'knows' he had been enlightened; he is totally committed to the authenticity of his vision. Finally, he finds this certainty very emotionally gratifying. From the mystic's perspective this enlightenment embodies the ultimate satisfaction of the hunger for truth.

It is obvious from the foregoing discussion that mysticism is by definition a solitary pursuit. Since the method of acquiring knowledge is bound up with the person of the practitioner, co-operative ventures are impossible. The best assistance which can be offered to the practitioner is advice concerning aids to contemplation. In fact when we examine transmission within mysticism, we see that actual training of novices does not proceed past this point. It cannot. In addition, since the knowledge attained in contemplation is private and the exclusive property of the mystic, no co-operative ventures in the area of accumulation and verification can be undertaken. It is the case that the orthodoxy of the major religions attempts to control the nature of mystical utterances. This control takes the form of according legitimacy and encouragement to those mystics whose accounts appear to be in accord with central beliefs, while discouraging and suppressing those utterances which are at odds with central traditions. This is external to and largely irrelevant for the actual practice and experience of practitioners. Therefore while there can be, and are, communities of mystics, there is no possibility for a mystical community. That is to say there can be no viable social enterprise of mysticism such as we find in science. Such an entity is incompatible with the basic intentions and assumptions of the mystical system.

Science

In contradistinction to the private nature of the mystical system lies the public enterprise of science. In this endeavor the search for hidden order takes the approach opposite to that of the mystic. Like the mystic, the scientist has faith in the existence of a discoverable order. He too recognizes the liabilities of the senses. Unlike the mystic however, the scientist embraces the senses as a primary source of knowledge. Instead of disregarding them because of their inherent flaws, he attempts to counteract the flaws, to correct them so that truth can be attained in a series of successive approximations.

The scientist does not place his primary faith in the mystical properties of mind. Rather, his enterprise is public - he places his faith on the viability of community scrutiny to eradicate error. The public nature of the enterprise necessitates the search for a different kind of knowledge. Only that which can be clearly stated, objectively communicated is acceptable. The entire content of the mystic visionary's enlightenment is therefore inappropriate and irrelevant to the scientist since this knowledge cannot by definition be objective, nor can it be communicated.

Science is conducted in a public fashion, taking the form of a dialogue between the practitioner and his community. The influence of the community upon the method of science is visible at every stage. The significance of theoretical problems, sequencing of experimental developments, recognition of contributions and issues, all take their meaning from the climate of awareness in the scientific community. Nowhere is this significance more obvious than in the issue of verification. The practitioner's convictions concerning the authenticity of his contributions are not definitive in science as they are in mysticism. On the contrary, they are inconsequential. Rather it is the audience of colleagues which determines the authenticity of claims. Once authenticated the claims themselves become 'community property'. That is to say, the knowledge is not part of the practitioner as in mysticism, instead, it is available to all (in theory) for further work or application. This public quality allows for the enterprise to be cumulative: clear progress is evident in the development of the body of knowledge. It is objectively clear to the observer that with the passage of time science explains more, and thereby enhances its body of knowledge. In the case of mysticism such a notion lacks relevance. There is no body of knowledge which can be objectively assessed, let alone enlarged or enhanced. Only the development of the individual mystic can be traced, and in the final analysis one has only the word of the mystic on which to depend in an assessment of this progress.

The fact that the knowledge of science is a commodity raises issues for science not confronting the other systems. Scientific knowledge can be put to use by the public in an endless variety of ways. Granted, magic formerly provided the same kind of service in many societies. It was supplanted in this function by science because the results of science are objective and predictable. Accordingly the usefulness of science is incomparably greater than that of magic in the manipulation of the empirical world. By virtue of this utility, science faces many demands and pressures not encountered in the other systems. Its situation in complicated by its position of dependence. Because science produces clear objective accounts of the nature of the empirical world, it is useful and therefore pressured. But the pursuit of these accounts requires extensive resources in order that sensory data may be refined. The need for resources creates dependence which imposes another set of constraints. By virtue then of its public nature, science is engaged in relations with its host society which are complex and problematic for both parties. This situation is not found in the more private pursuits.

Magic

The enterprise of magic straddles the line between public and private pursuits. Through this attempted compromise the magician endeavors to accomplish the ends of both mysticism and science. The practitioner's will, properly honed, is believed to serve both as the instrument for the acquisition of enlightenment of a mystical variety and as an instrument for the harnessing of knowledge in the manipulation of the empirical world.

Magic attends in subject to both the transcendent realm of mysticism and the empirical realm of science. This dual concern is reflected in the distinction between high and low magic. The link between these realms, seen as divorced by the other systems, is effected in magic with the assumption of the existence of the astral plane.

Duality is similarly found in the examination of definitions of knowledge. High magic involves a search for knowledge which is virtually indistinguishable from that of mysticism. Low magic seeks to enhance empirical lore appropriate to the scientific realm. The fact that high magic is accomplished with the help of low and that low magic derives its theoretical framework from the contributions of high magic further exemplifies the way in which the magical system attempts an integration of science with mysticism.

Further confirmation is provided with an examination of methodology. The observational skills and rigorous investigation of properties of natural substances under the aegis of a theoretical framework which characterizes low magic typifies the scientific approach. What makes the approach of low magic distinct is the insistance upon the significance of the magical will in producing any manipulation. That is to say, the methodology is not purely scientific because no event is seen as purely objective, accessible to public scrutiny.

The use of the practitioner's body and mind as principle instruments in knowledge acquisition found in high magic is also characteristic of the method of mysticism. It exemplifies the private aspect of the discipline. The distinctively magical cast to the method is provided by the role of the will. In mysticism the will must be abandoned and forgotten if the contemplative state is to be obtained. Magic requires that the will must be cultivated and nurtured until it dominates all aspects of being and awareness.

The conflict between demands for the annihilation of the will and the devotion to it manifest the different intents of mysticism and magic. The mystic wishes to see in order to understand and thereby find peace. The knowledge is his aim. The magician wishes to know in order to do. The doing takes two inter-related forms; in low magic he manipulates the environment, in high magic he manipulates himself in order to be transformed. This transformation itself then is seen as conferring more knowledge and more power in a never ending cycle of growth.

In magic we see the germs of the corporate enterprise which reaches full flowering in science. We see an incipient division of labor. Some traditions taking a cumulative form can be traced and a few collectivities attempting to systematize their efforts are known. Such developments are arrested by the private component of the knowledge, just as they are facilitated by the public. The importance of the will, of intuitive knowledge, of the transcendent to the magical system forever inhibits the maturation of a fully developed magical community. It also hampers our efforts to assess the validity of magical claims. As in the case of mysticism, ultimately we cannot with confidence confirm or deny the validity of the practitioner's claims.

INTEGRATION

The foregoing summary stressed the distinctive features of the three systems. One factor which must not be overlooked in the concern for distinction is the significance of the private illumination or mystical experience in all three systems. The capacity for mystical experience, as we have shown, exists in a potential or latent form in many if not all persons. This observation receives support in the research of Greeley & McCready who suggest that:

> ...an occasional mystical experience (sometimes very intense) is not at all uncommon. There are perhaps millions of people in our society who have such experiences with some frequency.
>
> (1974:4)

Such experiences, as we have already seen, are initiated by a wide variety of stimuli. Chemicals which influence neural function such as alcohol, opiates or the hallucinogens may initiate such an episode. Similarly, a host of more 'natural' situations, both sexual or contemplative in character may prove efficacious. Both relaxation and exhaustion, sensory stimulation, and sensory deprivation have been linked to the production of such experiences.

> The ordinary man allows this precious void (the mystical experience) to pass; but the truly lucid man continues to live in it.
>
> (Scharfstein, 1973:22)

As Scharfstein notes it is not the capacity for the experience which separates the mystic from the 'ordinary man' but rather the reaction to the experience. The true mystic views this experience as the gateway to knowledge in the form of 'expanded consciousness'. Consequently he will cultivate the experience in an attempt to refine, to prolong, and to savor its effects. This cultivation of the mystical experience forms the basis of mysticism.

It is the nature of the style of cultivation which underlies much of the diversity of mystical technique. Theological background stamps the mystical experience of the Hindu, Sufi, Buddhist, or Catholic with a distinctive form of practice and expression. Within these major traditions the individuality of practitioners finds expression in much the same fashion as the distinctive style of an artist both expresses his school and remains unique.

The practice of the mystic aims at satisfying the 'contemplative' urge in mankind. This is the urge to 'understand' reality in the fullest sense of the term. Scharfstein describes it as follows:

> ...the certainty that one is undergoing the direct, previously veiled touch of reality in itself; and that this reality more nearly resembles our internal experiences than our simply external environment. Since it is like the internal experience of a single person, the reality may be considered spiritual and essentially unified. As it is felt more and more strongly, it penetrates the self more and more deeply, or the self swells and reality becomes identical or at least very close.
>
> (1973:1)

Once this elusive state is obtained, the self participates in the All. In a cosmic sense then all is understood; one has attained true harmony, peace, and appreciation.

That the mystic quest pervades the practice of magic is clear from examination of the operation of the Great Work. Magicians concerned with Alchemy or High Magic recognize that attainment of this cosmic awareness will usher them into the final initiation.

> Alchemy was particularly safe as its stated aim, the transmutation of base metals into gold, posed no challenge whatever to the authority of the priests. Therefore it was behind the mask of alchemy that many players of the Master Game concealed their real aims, formulating the rules of the game in an elaborate secret code in which the transmutations of substances within the body were expressed in terms of mercury, sulfur, salt and other elements...But for serious alchemists the transmutation involved the formation of aurum non vulgi, or the genesis of the homunculus, both of which symbolized the creation of fully conscious, cosmically oriented man out of the ego-centered puppet that goes by the name of man but is really only a pathetic caricature of what man could be.
>
> (De Ropp, 1968:20)

This goal is not the only existing unity between mysticism and magic. The technique of High Magic, as we have shown, is heavily laden with both the concepts and the practices of mysticism. Indeed, one would be hard pressed to detect significant differences in technique separating the contemplative technique of Aleister Crowley and those of classical mysticism.

High Magic, while it bears profound similarities to mysticism is not identical to mysticism. The principle difference lies in the question of purpose. The magician wishes the All of the mystic; however, he does not typically desire this All merely to 'bask' in awareness. The magician adopts what we might term a more active stance vis-a-vis the empirical world. He wishes to know and through knowing, to do. High Magic therefore is a fusion of the aims of mysticism with those of a practically oriented science. The magus wishes to forge his mind into the ultimate tool, the consummate power source. Such an intention is fully in keeping with the basic assumptions of magic which stress the identity of mind and matter.

This stance is one which is out of keeping with the mainstream of mystical thought. Typically mystics would not necessarily deny that the acquisition of such powers is possible. They would, however, regard their utilization as a sign of weakness and hence of lack of true awareness. There is a very fine line here; one which the individual mystic practitioner frequently crosses. For example, the claims of Tibetan mystics as reported by Madame David-Neel combine mystical practice and Buddhist theology with the assumption of purely magical powers (1971). The other contentious issue on which mystics themselves do not agree is that of the nature of these powers. That is, to what extent the powers are purely mental in nature (experiencing the sensation of flying for example). In any event, to the magician such powers are real and attainable. To the central tradition of mysticism they are irrelevant, either delusions or temptations but not the object of search in either case.

The magician thus shifts the orientation of mysticism to one of closer involvement with the empirical world. He does so by uniting an essentially mystical practice with the theory of the macrocosm/microcosm. This allows the magician to develop his awareness through contemplation aided by the appropriate ambiance obtained from manipulation of the signatures or correspondences. This awareness can then be re-applied to the manipulation of the forces of nature using the signatures and the focused will. Thus the magician believes awareness and power grow in an endless cycle of mutual reinforcement.

Science retains elements of the mystical experience although in a far more rudimentary form than is found in magical practice. As we have seen these elements manifest themselves in the area of discovery. Einstein clearly reveals this affinity:

> I believe with Schopenhauer that one of the strongest motives that leads me to art and science is escape from life with its painful crudity and hopeless dreariness, from the fetters of one's own ever shifting desires. A finely tempered nature longs to escape from personal life into the world of impersonal perception and thought...With this negative motive there goes a positive one. Man tries to make for himself in the fashion that suits him best a simplified and intelligible picture of the world; he then tries to some extent to substitute this cosmos of his for the world of experience, and thus to overcome it. This is what the painter, the poet, the speculative philosopher, and the natural scientist do, each in his own fashion. Each makes this cosmos and its construction the pivot of his emotional life, in order to find in this way the peace and security which he cannot find in the narrow whirlpool of his personal experience. The longing to behold this pre-established harmony is the source of the inexhaustible patience with which Planck has devoted himself, as we see, to the most general problems of our science...The state of mind which enables a man to do work of this kind is akin to that of the religious worshipper or the lover.
>
> (Scharfstein, 1973:82)

The mystical experience appears to facilitate the release of the mind from the tyranny of existing categories. This liberation allows new conceptualization and insight to take root.

The mysticism of the scientists appears to take a predominately natural form. That is to say serious application of contemplative technique does not typically figure in the scientist's search for knowledge. The mystical experience is simply welcomed, its benefits reaped but not courted. Possible reasons for this are numerous. Mystical writings are typically steeped in religious speculation and presented in a largely theological vocabulary. Such work is unfamiliar to most scientists in that it does not reflect any part of their training. Further, science has developed in a tradition which is largely hostile to such expressions. Thus it is reasonable to expect that many scientists who have reported such experience would be surprised to discover that they could be considered to be mystics.

The strength of the overlap becomes more striking when we consider that it is not only the case that scientists have mystical visions; mystics have been known to report scientific visions as well.

Charles Singer (1958) enlightens on this point with his essay "The Visions of Hildegard of Bingen". Hildegard was a Benedictine nun who lived in the twelfth century A.D. She was known as a woman of great intellect and energy who became abbess of her house, a healer of renown, a correspondent of four popes, and an author. She is best known for her accounts of her mystical visions.

Hildegard, Singer states, saw "no distinction between physical events, moral truths, and spiritual experiences (1958:203). Such a view places her squarely [illegible] tradition of mysticism and in intellectual harmony with the central tenets of magic. For Hildegard all is truly one - internal and external, matter and spirit.

The fact which makes Hildegard of special interest is that her belief in "oneness" translates itself into the construction of scientific theories. A substantial portion of the transcripts of her mystical visions are devoted to the elaboration of these theories. She describes visions in which are depicted: the structure of the universe, the relation between macrocosm (universe) and microcosm (man), and the structure of the microcosm (Singer, 1958:205).

In her earliest depiction of the structure of the universe, Hildegard "saw" a spherical earth, seated in the center of the universe at the core of a series of concentric zones. These zones are spherical in the interior, shifting to an oval shape as one progresses outwards.

The theory attempts to account for the basic structure of the universe as well as certain major events such as the cycle of seasons and variation of weather. Here is how Hildegard states the substance of some of these early visions:

> I looked and behold the east and the south wind with their collaterals, moving the firmament by the power of their breath, caused it to revolve over the earth from east to west; and in the same way the west and north wind and their collaterals, receiving the impulse and projecting their blast, thrust it back again from west to east...
>
> I saw also that as the days began to lengthen, the south wind and his collaterals gradually raised the firmament in the southern zone upwards towards the north, until the days ceased to grow longer. Then, when the days began to shorten, the north wind with his collaterals, shrinking from the brightness of the sun, drove the firmament back gradually southwards until by reason of the lengthening days the south wind began yet again to raise it up.
>
> (Singer, 1958:210)
> from the Scivias

Further detail is unnecessary to develop the point that a substantial amount of her mystical activity concerned itself with a theoretical focus which was scientific in nature. Her theoretical activities did not however, become a vital part of the scientific discourse of her day. The reason for this has less to do with the content of her work than with the nature of her audience. Her correspondents were primarily members of theological community therefore the significance of her work was confined to within the borders of this community. This highlights the significance for science of the scientific community. A contribution, be it theory, observation, or refutation, cannot become a vital part of science unless access to the scientific discourse is obtained. Normally this access accompanies acceptance into the scientific community.

The mystical experience is a thread running throughout creative endeavor of all varieties. Within the three systems of particular interest for this work, we have seen this component acknowledged by practitioners. The content of the experience is in each case shaped by the particular aims and assumptions of the enterprise. The experiences of a mystic typically are those which emphasize the personal transformation or rebirth in consciousness of the practitioner with awareness or understanding as the goal. A rebirth coupled with power to manipulate mind and matter is the goal of the mystically oriented magician. The scientist utilizes such mystical experiences as occur to reveal 'discoveries'. In other words the scientist is prepared and informed by the relevant information at his disposal. The mystical vision of the scientist clarifies and reveals the hithertofore confused or hidden potentialities of this material. It allows him to utilize his resources in a more intellectually powerful and creative fashion.

This preparation and informing which is shaped by the tradition in which each mystic participates stamps the translation of the vision into linguistic or visual terms. The tradition provides the practitioner not only with sets of techniques but also with expectations.

These expectations are united with a particular language to produce an end result characteristic of the school.

Two other changes occur in the content and tone of the mystical experience as one moves from mysticism through magic to science. First, the nature of the vision becomes less purely subjective or personal and more objective or public in character. The vision of the mystic, as we have seen, is interpreted as primarily ineffable, inexpressible, and uncommunicable. The vision of the scientist, by virtue of the demands of his enterprise has been transformed into an account which is objective and publicly accessible. The second transformation accompanies the first. This is a shift in emphasis from metaphysical or supranatural concern to statements of the working of the empirical world. Again, these transformations reflect the guiding assumptions of the traditions of investigation.

Just as we have seen a continuity of focus uniting mysticism, high magic, and science so too there is continuity between the practice of low magic and that of science. Low magic, is dominated with concern for manipulation of objects for 'mundane' results - production of crops, fertility, cure of disease. Guided by the theoretical structure of the doctrine of signatures, as developed by the local tradition, low magicians investigate the properties of substances. As this stands there is nothing which separates this practice from that of science. Observations are made, recorded, maintained as a growing tradition accessible to at least the community of related practitioners, The entire enterprise is informed by theory, in this case that dealing with the correspondences.

There is one factor dividing the practice of low magic from that of science. This is the issue of the role of the practitioner in the production of the material results. Low magicians believe, as has been shown, that efficacy does not rest in the material characteristics of the substance alone. They believe that the mind must charge the substances with power in order to produce the desired effects. This represents the private aspect of the practice of all magic in that this power resides in the magician. It cannot be conferred, only developed. Results cannot be obtained uniformly.

Science endeavors to eliminate the private element. While a discovery may reflect the peculiar genius of the scientists, once made it is accessible to all of sufficient training. Results are uniform: they do not reside even in part in the practitioner. This occurs by fiat. Findings are only acknowledged as such when they have the quality of this objectivity.

We might speculate that as investigators discovered that the characteristic strengths of properties existed independently of the investigator's intentions, science was born. Certainly the approach allowed for striking progress in the formation of theories and the manipulation of materials. Part of this effect can be linked to the quality of publicity or objectivity involved in science. Magic provides an easy escape clause to justify failure, even repeated failure. This is the failure of the magician to reach the perfection of will in the ceremony. Thus any failure can be readily explained while preserving the integrity of the approach, masking such inadequate comprehension of the material properties as might be present. Further, since the desired effects are assumed to take place in 'natural fashion' and in 'good time' even success is difficult to recognize.

The quality of objectivity in science allowed for comparatively rapid differentiation between success and failure, accuracy, and error. Developing science quickly usurped many of the functions of low magic. Curiously enough however, some of the assumptions of magic reappear to vex scientific progress. Currently medical science, for example, after years of rejecting a 'Witch doctor' approach to ill health in favor of the 'more scientific' physical model must now in some cases let the mind back in. In questions involving such diverse phenomena as submissive death, biofeedback, healing, psychosomatic illness, doctors are confronted with the apparent influence of mind over matter. Thus a basic assumption of magic re-emerges as a challenge for science.

SATISFACTIONS

In our time interest in the occult and the mystical is soaring. Thousands reject conventional medicine and flock to psychic healers (Nolen, 1974). The inflex of tourists seeking psychic healing is of such magnitude as to constitute one of the leading industries in the Phillipine Islands. Occult movies draw huge crowds, magical treatises long forgotten and reissued, and occult bookshops spring up like mushrooms after a rain. Ecstatic religious revivals are witnessed as is an increased preoccupation with the mystical practices of the East - notably Zen and Yoga.

Such interest can be explained at many levels. Anthropology has developed strong functional analyses of witchcraft and sorcery (see for example Marwick, 1970) which could be applied with profit to the contemporary scene. Social psychology has focused on the existence in our society of certain 'situations' which produce 'needs' which occult or mystical activities ostensibly fill.

Webb (1974) for example, extends Fromm's work to account for the occult revival. He asserts that the alienation of modern society sends man into a flight from isolation. Belief in occult practices then constitutes a new 'belonging' and can therefore be associated with similar flights to religious cults and political movements. Such an analysis is consistent with that presented by Greeley in his account of the basis for the current mystical revival.

Greeley asserts that modern developments in warfare, ecological crises and the like have shaken man's faith in science.

> The psychedelic revolution, the mystical revival, the occult culture, the communitarian movement, the hippie life style, the Woodstock fervor, the counter-culture, the emergence of Professor Reich's consciousness III, are all consequences of the failure of the gods of discursive reasoning and positive science.
>
> (1974:113)

Science, it is argued, has not fulfilled its early promise. We have not perfected our world in the fashion of utopian Enlightenment dreams. Our technology has failed to bring us true fulfillment. This disenchantment takes characteristic form, Greeley maintains, in the atmosphere of increased personalism, the second critical feature of modern life.

> ...the strong and emphatic insistance that man lives not for some other worldly happiness or for the service of some state, party, or people but for his own personal development, enrichment, and fulfillment.
>
> (1974:114)

Thus as we crave fulfillment and blame science for its failure to satisfy this urge, we look away to one of the so-called irrational movements.

The 'void' argument is also prominent in Nolen's account of psychic healers. He suggests three reasons why people (particularly western people) seek out such cures. First, in cases where western medicine has pronounced a sentence of hopelessness, it is only reasonable to expect patients to seek out those who do promise hope. Second, western medicine frequently drives patients to psychic healers by failures in human relations. Doctors fail to show sympathy and concern, fail to explain the expected effects of treatment including side effects and the time required to show improvement. Psychic healers provide such support for patients. Herein lies the basis of their popularity. Finally, psychic healers do in fact heal. Cases in which the patients' physical state is linked to his mental state, or sense of well being or autonomic function are frequently responsive to treatments of this sort. This is significant in light of Dr. MacLean's assertion that up to 40% of patients consulting general practitioners have complaints which are at least partially stress or emotion related (1971:124).

We have no wish to dispute the general tenor of this position. It outlines quite adequately the 'pushes' to such activities - the motivating factors which cause people to search for 'something' to fill their lives. It might be added that this 'disenchantment' with science so frequently mentioned probably represents the unfortunate emotional side effects of an intellectually positive change. That is to say it could represent the birth of an awareness that the claims of the Enlightenment for science are illegitimate. We demand things from science that are not in the nature of the enterprise to grant. Practitioners of the discipline can find vast personal fulfillment in the practice of science. It is difficult to see in what way science as science could provide 'fulfillment' for non-practitioners. Similarly our condemnation of science for the woes of modern life - nuclear wars, ecological crises etc. reflects not so much science's failure as our own. The role of science is the acquisition of knowledge. Knowledge is a possession - passive in and of itself. Like a gun, it requires a guiding hand to transform it into a tool for 'good' or 'ill'. Science has succeeded brilliantly in its task. We have abdicated our role in determining what we wish to do with the fruits. Our disenchantment should be not with science but with ourselves.

What the 'void' argument neglects is an account of the 'pulls' or promises unique to magic and mysticism. Here practitioner's accounts are of essential interest. Clearly while the same forces may impel a person to seek satisfaction in Jesus or in witchcraft or Zen, the practices are not identical. There are distinctive 'opportunities' presented by the occult and mystical activities which must be considered in any complete account.

Simply stated, the common promise is one of a uniquely personal potency. Magic promises power which is the practitioner's to wield at his pleasure. To argue that magic is irrational in that it aims to produce effects which are immediately and more efficiently obtainable through the use of other available tools and agencies quite misses the point. Magical power need not entail reliance on any other (material) person, object, or agency. One requires no permission to practice, no co-operation, no licence, no technology. In a world where each person's activities are increasingly circumscribed by an infinity of constraints such a promise is by no means inconsiderable.

The seductiveness of mysticism is of a similar nature. Mystical practice promises the student a direct apprehension of truth. Once such an encounter has been effected, no intermediaries are required, nothing need be taken on trust or by authority. Particularly for those seeking to sustain and enhance a religious consciousness the opportunity is incomparable and irresistible. A faith founded on direct knowledge supported with absolute certainty could transcend the need for reliance upon dogma and erradicate doubt. Under the circumstances, and given that history provides support for the promises in the form of the wealth of mystical works, one wonders not why there are so many mystics but rather why there are so few.

Thus it is the private conception of knowledge demarcating science from both magic and mysticism which provides the latter enterprises with their essential promise. The seductiveness rests in the promise of attaining something wholly personal which is contingent upon no other power or person, which can neither be taken away or denied. Private conceptions of knowledge represent the ultimate cure for perceptions of powerlessness. They provide the supreme temptation for those who dream of tyranny which could in part account for the apparent association with leading figures of the Nazi movement with the occult (Brennan, 1974). Such conceptions promise an end to doubt and uncertainty, a dream which is undeniably attractive to those who live in confusion. They promise an enhanced sense of self and of one's place in the scheme of things - surely an inducement to those who fail to develop a functional sense of self. In short, the private conceptions of knowledge provide enduring attractions because they appeal to all of the most exhalted and most debased qualities of human character - to all of our strengths and weaknesses.

CONTROL

The satisfactions intrinsic to each system ensure that they will continue to find practitioners. The existence of practitioners and the fruits of their practice presents problems of control for society. These problems will be discussed below.

Mysticism

The control dilemma presented in mysticism is this: to what extent can we rely on certainty which is inaccessible to scrutiny to influence our intellectual convictions or moral prescriptions? In many societies the mystic is simply accepted as leader or prophet on the basis of his supposed illumination. His attainment of trance coupled with his certainty of illumination provides the basis for an accreditation of legitimacy to his pronouncements.

We know however that some mystical revelations are false. This conclusion is drawn from an examination of the mystical visions of Hildegarde of Bingen. While we cannot comment on the validity of her metaphysical and theological insights, it is clear that her 'scientific visions'; that is, her visions (which were translated into observations about the nature of the empirical world), were quite false. It would seem then that _if_ correctness is to be an important criterion in defining our response to claims, that we would wish to , some procedure through which we could distinguish true vision from false. Such a procedure does not and cannot exist in the realm of private knowledge. This as we have labored to demonstrate is the central dilemma of mysticism as an intellectual pursuit. Certainty is the hallmark of the mystical vision. The practitioner can however be as certain of vision as of true. Yet because the vision is subjective and self contained we cannot in general verify it.

The contemporary response to this has been a blanket rejection of mysticism as an intellectual enterprise. The rise of the psychological model of mysticism is one demonstration of this trend. Such a response seems excessive and wasteful. We have shown that there are clear comforts to be obtained from the practice of mysticism. It can serve a significant personal function. Further, it appears that a significant component of the population have these experiences even in the absence of systematic practice. One questions the wisdom in arbitrarily declaring all such experiences inauthentic. Finally, we have seen that the mystical experience forms a substantial element of both intellectual and artistic inspiration. While we can make no definitive conclusions concerning the extent to which mystical practice confers knowledge, it is clearly evident that it is an important source of ideas. We conclude therefore that a blanket rejection of the contributions of mysticism is unwise.

This does not take us far in the solution of our problem in defining a reasonable response. The approach taken by two unrelated bodies provides additional insight at this point. The scientific community responds to the issue of inspiration as follows. Questions of discovery are divorced from questions of justification. It is irrelevant to science from whence ideas come. Whatever their source, they must be frameable in clear objective form such that they can be useful in the cumulative enterprise of science. No distinction is made between those ideas which emerge from the logic of on-going research and those resultant from a mystical revelation. Indeed the source of ideas is seldom discussed in the literature.

In the light of the presumption of inaccessibility which characterizes mystical knowledge, it seems paradoxical to suggest that it could be of any use at all to science. Science's response is to suggest that it will ignore any vision which cannot be framed in objective terms. Any vision experienced by an accredited practitioner can serve as a basis of further work provided that some component of it so expressed in workable terms. Accepting then, that the totality of the experience may well be private, science requires that the subjective component be separated from the objective. That which remains private is ignored as irrelevant for the task of science. That which can be expressed in objective terms is utilized.

It would seem that the intellectual orientation of the practitioner aids in this process. That is, the interests of the individual seems to shape the content of the vision. It is otherwise difficult to explain why scientists appear to have a predominance of "scientific visions", religious thinkers, religious visions, and so on. In the light of this it would seem reasonable to suggest that the awareness of the requirement of objectivity encourages scientists who experience mystical insight to translate their experiences into terms useful for science.

In summary, the example of science accords important insights regarding our response to mysticism as knowledge. That is, an intellectual effort cannot survive and progress in the absence of some sort of standard of verification external to the person. We cannot rely only on certainty as a basis of knowledge because one can be certain of what is false. Therefore in order to salvage something of value from the mystical experience in our intellectual endeavors, we should utilize that component of the experience which can fulfill the personal functions.

With respect to these functions involving questions of mystical prescription in the area of faith and morality, the answers of religious orthodoxy are enlightening. The religious establishment essentially sets aside the question of truth. Mystical experience in general is seen as potentially truth conferring. In specific cases, only those illuminations in accord with accepted belief are granted legitimacy. In practice then the potential for mysticism to contribute dramatic new insights is effectively discounted. Clearly this represents a decision that the virtues of order override the possible values of new knowledge in this area. In the absence of criteria for assessment this seems a wise course indeed although one frustrating for the individual practitioner.

As a society we need not carry this policy to such extremes. Heresy is no longer a crime in any but totalitarian societies and it is clearly a good thing that this is the case. The state has no business policing the thoughts of its citizens. It clearly has, however, the task of policing their actions. Therefore we should tolerate and even encourage the cultivation of mystical experience among our citizens if for no other reason than to enhance self-development. However when such experiences produce prophets whose actions or prescriptions threaten or violate our prevailing community standards and beliefs then it is clearly our duty to sanction. We cannot allow one man's inaccessible source of certainty to be used to justify violations of our order. It is regrettable that in so responding we risk the possible suppression of true visionaries. Our consolation is that it is unlikely that sanctions will totally suppress true vision. Superior moral visions would ultimately transcend our controls. What we are describing finds an analogy in the case of science wherein we described the fate of observations and theories which, although correct, were not timely. It would seem that in the case of metaphysical and moral discussions as well, that we can use what we have become ready to accept. Anything else is futile or dangerous.

Magic

In the case of mysticism the problem of control reduces to a problem of credibility. That is to say, mystics rarely take an active role in interfering with the course of social affairs. The reflective nature of their enterprise seems to preclude such activities. Society's problem then seems to be one of determining the appropriate response to the mystic's advice. When we move to the system of magic, however, the question of control becomes more pressing.

Magicians do not merely advise; they act. Sometimes these actions involve direct physical harm perpetrated upon unwilling victims. In this case the magician can be treated through the mechanism of the criminal law since there is in such cases an obvious physical harm and accompanying physical act. Thus the magician who administers poison, or who engages in human sacrifice calls forth the same response accorded any criminal.

The activities of magicians pose more subtle dangers as well. The sheer fact of belief in the power of magic creates this power. The rather substantial literature on voodoo death amply illustrates this point (Franklyn, 1971; Cannon, 1957; Mathis, 1964; Lester, 1972). Thus the fact that a person believes in the power of a sorcerer creates the potential for his death by enchantment. In such cases while there is clear physical harm it is extremely difficult to establish within the limits of legally admissible evidence, any connection between the perpetration and the harm.

Belief in magic involves additional problems which fall short of those of death by enchantment. Magic is predicated upon the belief in the power of mind. Tremendous feelings of vulnerability and insecurity can therefore be created in those who believe themselves to be at the mercy of other men's minds. While traffic in magic can be seen to emerge from perceptions of powerlessness; belief in magic if not accompanied by awareness of competence in its practice magnifies the sense of impotence. The feeling that one is defenceless from the thoughts of others, even unknown others is unlikely to enhance trust and social solidarity. Such perceptions if unchecked, can lead to a defensive spread in the practice of magic. The power and control exerted by magicians can also be enhanced as a consequence from traffic in defensive charms as the people seek to buy protection from the peril of malign wills. In short, the belief in the power of magic carries with it the seeds of contagion. The peril involved is quite real. It exists independent of the validity of the assumptions and techniques of magic. Such a threat poses very real problems of social control.

The potential for contagions surrounding belief in magic manifests itself in another sphere; namely, in the 'witch craze'. Widespread belief in the existence of practising magicians coupled with belief in the potency of their practice sets the stage for repressive persecution of these people. The covert nature of much of magical practice makes identification of practitioners problematic. Therefore there is a decided tendency for such purges to involve the innocent. Further, the lack of consensus concerning the limits of magical powers facilitates the blaming of all misfortune upon magical wrong doing. Thus, the belief in magic sets the stage for possible persecutions. Periods of crisis, social upheavals, or unrest provide the trigger which ushers in the purge.

Western Europe provides a horrendous example of the operation of a full scale witch hunt. The European witch hunts lasted for several hundred years and resulted in the death of hundreds of thousands of victims. It is likely that some of these people did engage in magic, particularly natural magic connected with healing (Szasz, 1970).

Most we now see as innocent victims of the panic. As Trevor-Roper states:

> It (a witch-craze) can also be extended blindly, in times of panic by its own momentum. When a 'great fear' takes hold of society, that society looks naturally to the stereotype of the enemy in its midst; and once the witch had become the stereotype, witchcraft would be the universal accusation.
>
> (Marwick, 1970:145)

The panic, once initiated, creates its own momentum. The more witches are uncovered, the more the people fear witches since their community is obviously riddled with them. The greater is their fear, the more frequent their accusations and the more fervent their endorsement of the hunts. The fact that practitioners of the occult are difficult to identify, their knowledge private and their practice obscure makes for easy recourse to torture. How else can these threats to the community be uncovered?

The Gusii have a much more civilized answer to this question. A belief in witchcraft is part of the lore of these people hence they must confront the problem of control of both witches and allegations of witchcraft. Their solution is rather ingenious. They rely on ordeal to identify a witch, as did the witch-ridden Europeans. However in the case of the Gusii tribesmen both parties - accuser and accused must submit to the ordeal since:

> The Gusii say that this kind of back biting (false accusation of witchcraft) is just as bad as witchcraft: and in this they are quite logical since both back biting and witchcraft contain the same element of turning disloyal to one's neighbours.
>
> (Marwick, 1971:59)

Needless to say such a mechanism keeps allegations to a minimum in this society.

This elegant solution is unworkable in societies which have transcended ordeal as a measure of justice. It also requires a stable community for success, the antithesis of the sort of conditions in which witch crazes flourish. For those communities where the Gusii method is unworkable, it is clearly safer if the people simply do not believe in magic. The absence of belief does not remove the threat of the criminal magician. Such people can be contained, however, and the lack of belief does serve to eliminate the source of the problem of contagions of both varieties.

Unfortunately, experience teaches us that the belief in magic is fiercely tenacious. Among peoples schooled in both magic and Western science, belief in both systems frequently co-exists. The afflicted will for example frequently consult both the natural magician and western doctor in a search for remedies. Even in our own supposedly enlightened and scientific society we find continued remnants of this belief. Thousands consult astrologists, palmists, aura-readers, tarot readers, and fortune tellers of various sorts. This resort to magic continues despite concerted campaigns from the scientific community to convince the people of the insubstantial nature of the practice. Witchcraft is practised by scattered covens. Satanism flourishes with its leader LaVey, an international media figure. The attractions of magic clearly continue to be seductive despite rational argument to the contrary.

Therefore while public education to disabuse the people of their faith in magic seems a profitable strategy, we should not be so deluded as to suppose it to be a panacea.

We do know that such contagions have a life span. Perhaps, like Camus' plague, contagions of magic will simply occur and recede following their own logic and quite independent of our society to control them.

There is one primary safeguard which is subject to manipulation and that is routinization. As John Le Silentian, known as the Second Hermit[1] recognized in the thirteenth century, banality destroys the power of magic. The symbol has potency only so long as it is "sacred" in the Durkheimian sense. So long as magicians are remote and their activities little understood they will be feared and this fear will give them power. That magicians themselves recognize this fact at least tacitly, is evidenced by their insistance upon the maintenance of secrecy in their activities. In modern times therefore the commercialization of magic can be seen to serve a significant latent function in its control.

Science

In examining the control problems which are posed by the existence of magic, we discover that the problems are contingent upon belief but independent of validity. Such is not the case with science. The scientific enterprise has scored the most impressive public successes in the production of knowledge. And it is in these very successes that the dilemma of control resides.

The first issue is that of access. The enterprise of science being public in nature, there would appear to be no problems arising from the access to knowledge produced. It would seem at first glance that all should partake of scientific knowledge, making of it what they would. Unfortunately as we know, the issue is not this simply resolved. Some of the knowledge produced in science can be used to destructive ends, it would therefore seem that only the responsible should have the opportunity to sample of it. For example, considerable concern is now expressed over the fact that a few hours browsing in libraries and a few more spent in tinkering in one's basement will allow the layman to produce a bomb of fairly large destructive potential. A little more effort and expertise coupled with the theft of radioactive substances will permit the construction of a "bootleg" nuclear device. Such possibilities arouse every healthy concern in the community suggesting the need for some form of censorship. This perceived need is further enhanced by the involvement of government and industry in the support of science. Both national defence and industrial profit lend themselves to advocacy of restrictions in the publication of scientific knowledge. Continued support of science by government and industry is presumably based at least in part on a certain compliance in this regard.

Thus there are some very good and a few instrumental reasons favoring restriction of access to scientific knowledge. Unfortunately, a public enterprise can survive only insofar as it remains public. The development of a cumulative progression in any area of science rests upon the opportunity for investigation of other's work. To the extent to which this is limited the enterprise is brought into jeopardy.

The interests of safety, security, and profit are at odds with the interests of scientific development. No blanket resolution can be posed to this dilemma. It would appear that the best which can be attained is a series of working compromises based upon the results of each case. The "worst" which can be feared is control so massive as to fatally mar the continued progress of the enterprise.

This entirely begs the question of the public's right to be made aware of both scientific advances and the sort of science which their monies are indirectly supporting. As we showed in an earlier section, the question of priorities in funding is itself a morass of competing values and criteria. Here again it would seem that what confronts us is not a problem whose resolution merely awaits discovery but an endless dilemma which can never be terminated, only accommodated.

Scientific knowledge poses by its very existence another related problem. Once knowledge has been produced, nothing short of general societal collapse can cause it to be forgotten. Like the rebellious Geni, it would not quietly return to its bottle. We must confront the knowledge and the possible actions implicit in that knowledge. Frequently our progress in science appears to outstrip our ability to comprehend and control the issues which the knowledge raises. The profound moral questions raised by genetics research are but one instance of this situation; there are countless others. The fact that the creation of new techniques, processes, and procedures results in unanticipated consequences - changes which could not be predicted at the time of the discovery, makes the problem all the more acute.

It is clear that as science grows in intellectual productivity this issue of control is rendered more critical. When considering social science, for example, it is fashionable to decry the current inability to produce "answers" to problems of behavioral control in, for instance, the area of corrections. In point of fact this failure is most probably a saving grace since we appear totally unprepared to cope with the implications such knowledge would carry should it be produced.

As with the other issues in the control of scientific knowledge, it is one thing to raise the questions, quite another to envisage answers or resolutions. One stop gap resolution would be stricter control exerted from the scientific community over communication outside of that community. In other words, the enterprise of scientific study would carry on as in the past with a continued emphasis on communication of findings through the medium of the scientific journal. The carrying of information out of this forum to the press, the talk show, the government commission would however be strictly monitered. In this sense the scientists would become judges of what the community was ready to hear, and of the form in which knowledge would be presented to the public. Such a suggestion is elitist and hence unlikely to be popular in this democratic age. It founders, in addition, on the question of the public's right to know. All moral and philosophical debate aside however, the proposal is rendered tenuous on the basis of the nature of scientific funding. It is difficult to see how an enterprise which is dependent for its continued existence on government and industrial benevolence could exert such control over the demands of its benefactors.

The conclusion that we reach at the end of this long exploration then is that the intrinsic satisfactions of each system are likely to ensure their persistence. Should any of the three succumb to social pressure, they are likely to be revived at some later time. The satisfactions then are enduring. They give rise to coherent forms of inquiry propelled by a logic intimately related to the intent or desire. We will probably never be able to adequately assess the validity of the claims of the private forms of knowledge although scientific advancements in the field of neural physiology may contribute to an understanding of the processes involved in such systems. Questions of validity aside, all three systems present distinct and serious concerns in the realm of social control. These concerns are complex involving both moral and instrumental issues. As long as men are free to inquire, these questions are likely to plague us defying convenient resolution.

FOOTNOTES

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XV

EPILOGUE

EPILOGUE: ON SOCIAL SCIENCE AS SCIENCE

The discussion of science has focused on the work of physical science. There is a need to use these insights to illuminate our understanding of the state of the social sciences. For while bravely declaring ourselves to be social sciences, we are cowed in the face of the stunning edifice of knowledge in the physical sciences. We have yet to produce a Darwin, a Newton, a Lavoisier and recognition of this inadequacy causes a questioning of our basic nature.

Are we indeed a science? Does our lack of production condemn us to some alternate and presumably lesser status? A definitive answer to these questions is impossible at this time since science reveals itself in success. In the fullness of time our status will be clear. At this point we must rely on faith in our promise.

Nevertheless it is instructive to examine the practice of physical science as it has revealed itself in our investigation. Such an examination reveals some characteristics of physical science which have proven to be instrumental to success and which are neglected, ignored, and misunderstood in the social sciences. A re-assessment of our endeavors in the light of these insights could contribute to increasing success in our own search for knowledge.

One of the first and most striking disparities concerns the issue of measurement and observation. There exists a lamentable tendency in the social sciences to believe, after the fashion of Francis Bacon, that scientific knowledge simply emerges from our data like Venus rising from the foam. Accompanying this view is an acquiescence to computer technology. All too frequently we appear to believe, or at least behave as if we believe, that once we have collected sufficient observations and rendered them to the computer knowledge will emerge in the print-out, digested and neat, embodying clear-cut findings and generalizations at worst, natural laws of society at best. Such views although periodically attacked, most notably by C.W. Mills (1959) and Pitrim Sorokin (1956) persist and endure with tenacity. They are encouraged by the "publish or perish" emphasis of university departments which measure intellectual productivity by the page rather than by the idea. Incredibly they are justified in the name of science.

As we have seen such an approach could not be more distant from the approach of science. Physical scientists, as is evident from their practice, do not operate in terms of such random empiricism. Their inquiry is informed by theory, guided by insight and intuition. There is no assumption that "facts speak for themselves". Further, in the informal hierarchy of science, measurement is seen as a decidedly second class activity, useless at worst, servile at best.

Neither does the theoretical component of physical science exist in a vacuum as is all too often the case in social science. Rather a functional and productive collaboration is the rule. The strength of this collaboration between theory and method, idea and practice, is enhanced by a division of labor. As we have shown, one of the foremost facts of life in science is the existence and strength of the scientific community. The existence of a viable co-operation and division of labor in this sphere allows for specialization and maximal talents. Progress is thereby enhanced.

Such organization is not in evidence in social science. There is little or no shared understanding uniting thinkers and technicians with the result that the product of the thinkers is acknowledged as insightful and forgotten while the product of the technicians is passed off as thought. It is only in the social sciences that the phrase "only theory" has meaning. Social scientists are the principal sinners in considering statistical tests for spuriousness to be tests which will culminate in "meaning". We have yet to fully realize that, as Polanyi states:

> ...can scientific propositions be derived...by the application of some explicit rules of procedure?... assume that all relevant experience is given us in the form of numerical measurements....from which we have to derive some mathematical law of nature. Could we do that by the application of definite operations? Certainty not. Granted for the sake of argument that we could discover somehow which of the figures can be connected so that one group determines the other; there would be an infinite number of mathematical functions available for the representation of the former in terms of the latter. There are many forms of mathematical series...each of which can be used in an infinite variety of fashions to approximate the existing relationship between any given set of numerical data to any desired degree. Never yet has a definite rule been laid down by which any particular mathematical function can be recognized among the infinite number of those offering themselves for choice as the one which expresses a natural law.
>
> (1964:21)

On the other hand, our theorists fail all too frequently to recognize measurement as being a crucial component of their work. We cannot hope to achieve results as a science while ignoring this essential fact. Our results will be slow in coming if we do not develop a functioning division of labor, so that the work of each specialist can be meshed with every other.

We have failed to make our enterprise properly cumulative in the manner of physical science. The observations, experiments, and findings of others are used as a platform for critique but not primarily as a basis for further observations and experiments. (Experimental psychology and social psychology are laudable exceptions to this trend). There is no agreed upon frame of reference within which work can be assessed, nor is there any basis upon which one person's contribution can be simply accepted and taken for granted. This weakness reflects back to definitional and classificational problems. Until we can agree on questions of language and category, questions of fact and theory will be beyond us. These definitional and classificatory decisions need not be permanent, indeed they should not be so since a growing discipline requires changes in conception which entail changes in language. They simply serve as a convenient platform for evaluation and debate.

The absence of such would seem to lend credence to Kuhn's assertion that social science is pre-paradigmatic (1962). The frame of reference need not be an accurate reflection of "reality". It simply provides for the existence of universe(s) of discourse such that communication may become more efficient. As communication is the essence of scientific verification and advance such a framework is essential for progress.

Social science at present is more of a quasi-magical endeavor than it is a science. Practitioners possess a loose set of ill defined techniques and a collection of "insights" from the literature. Each starts anew on various problems of interest. Each attempts to construct a science virtually "from scratch".

This problem is exacerbated by the neglect, except among ethnomethodologists, of the mundane. Astronomy did not begin with Newton, or even with Ptolmey. Rather it began with notions about the alteration of day and night, observations of the steadiness of some stars, the wanderings of others. Social scientists have a tendency to attempt to short circuit this process by leaping directly to major issues, epic problems - war, crime, the basis of order.

We too frequently use the impossibility of experimentation in social science to excuse our lack of progress. It is the case that the true controlled experiment is difficult to effect in the social studies, also that sometimes experimental work is simply not possible at all. We forget that the experiment is not science but only one tool of science, albeit a powerful tool. Many sciences, including astronomy, the first to develop, progressed in the absence of experimentation. They did so by stressing the accumulation of painstakingly accurate observations of all relevant events and wedding these along the way to the fruit of intuitive speculation. Progress was not made by the "emergence" of law from observation. Neither was it made from rational thought alone. It was based on a fruitful collaboration of observation, thought, and criticism based on the mundane, the routine, the perceptible. It is not until such basic conclusions have been drawn that the more obscure forces may be revealed. This holds true even when, as is usually the case, the conclusions drawn from mundane observation are subject to revision. In fact, the new findings derived from the sophisticated studies typically turn back upon the familiar to inform theory in a new way. Such was, the case with atomic theory in its evolution from the "particles" of Dalton to the contemporary sub-atomic particles and quanta. This notion of a necessary progression of knowledge is the second sense of cumulative - one similarly neglected in the social studies.

Another facet of the organization of science is neglected in the social sciences, particularly in sociology. In physical science growth in knowledge has been accompanied by specialization both of the practitioners and of the literature. Scientists typically work for extended periods in very small corners of their disciplines, usually sharing the area with no more than a handful of colleagues. The literature is generally so organized as to direct attention from any of these divisions to a limited body of relevant work. Such an organization may well produce "half educated", "narrow" practitioners but it is clearly extremely efficient in the production of knowledge.

Social scientists on the other hand, do not so concentrate. They typically shift in rapid succession from one area of interest to another. Such changing virtually precludes mastery of the literature. In fact such shifting encourages cursory examination of the literature thereby increasing duplication of effort, failure to be cognisant of criticisms, and omission of new insights. This tendency in social science receives encouragement from the pursuit of topicality - the "newsworthy" current items. In addition the overwhelming tendency to engage in applied work - work chosen according to interests other than those of simply advancing the discipline, further entrenches this problem.

This strong tendency to applied work reflects upon another strength of classical science. It is apparent, not only in science, but in mysticism and magic as well, that absolute faith in the enterprise is an essential basis for practice. One can question the knowledge or the details of technique and thereby refine the product. However practice is impossible in the face of question concerning the ultimate efficacy of the method. To the extent to which such doubt pervades the social sciences they will be crippled. There can never be proof sufficient to demonstrate with certainty that our enterprise is well founded. In the epistemological sense, one can never know whether a system of search produces knowledge.

Apart from this basic faith, evidence from the physical sciences indicates that essential contributions come from those with undivided loyalty to science. There is a need to see the activity as crucial and valuable. It must be seen as important in its own right, not merely as a thing of instrumental importance.

Productive scientists appear to be those who are convinced of this. Further, they are absolutely devoted to their studies, not to their careers or to the good that their studies can do. They are able to avoid both the distractions of material temptations and the demands of social conscience. As mystics long held with their interpretation of the parable of Mary and Martha, contemplation withers in the face of distraction - even worthy distraction.

This is an unpleasant illumination but an important one. The career of Raspail (Weiner, 1968) illustrates our point. He was a man of diverse and impressive talents, both scientific and political. He was, in addition, torn between devotion to science and the demands of his social conscience. As he became involved in political activities his scientific productivity ceased. Such is more likely to be the case in those whose talents are greater, more thoughtful, more insightful. They are more delicately balanced, more easily overthrown by distractions.

Social scientists unfortunately have yet to accept this. They tend to easily accept that the policy oriented, the helping activities, the political involvements are things which are good in and of themselves. However there remains a sensitivity to criticisms of the irrelevance of the endeavor of basic social science resulting in attempts to justify science as it lends itself to questions of policy. There exist too many divided loyalties, shallow commitments, and intellectual insecurities.

Social science did not develop in a continuous tradition with physical science. The study of man and society was historically the province of philosophy and theology. Reason and authority were therefore the two, although often opposing, pillars of thought in this area. Indeed, much of the intellectual turmoil of the medieval period surrounds the attempt to establish a satisfactory relationship between reason and authority. The point is that the approach of science was never a viable part of this tradition until the Enlightenment. At this time a conjunction of several curious forces took place which triggered a number of social consequences, the ascendancy of science and the birth of social science being but two.

Newton was the intellectual demi-god of the period. He had transformed the universe with his epoch making discoveries, revealing it to be a place of harmony and order, serenity obedient to precise, eternal laws. One effect of Newton's work was the establishing of what Ben-David has called a scientistic movement (1971:90). The beauty and certainty of the Newtonian system was adopted by the philosophers, particularly the French. Ben-David describes it thus:

> The scientistic movement in French intellectual opinion consisted from its very onset of persons with practical interests in politics and economics. Their principal aim in using science as a model in political and economic affairs was to provide objective, "scientific" proof of the necessity for changes which they desired and which they could not or would not support by traditional arguments. They were often careless and superficial in their thinking. There was a great deal of confusion about the meaning of scientific laws when applied to human action and much confusion about statements of fact and value.
>
> (1971:90)

Thus the impetus for the development of social science came not from practitioners of science but from philosophers versed not in experiment but in logic and reason. These people had neither experience nor understanding of science. Of utmost significance is the fact that science was adopted an an honorific- thus inaugurating its instrumental use. It was not seen as an activity to be engaged in by scientists for its own sake.

Gillespie (1951) concurs arguing that the philosophies borrowed from Newton's prestige to justify their own ends while understanding neither his method nor his findings (1951:152). He points to the fact that the Newtonian system was admired for its reason, not for its science.

> Newtonian mechanics was universalized in thought, not because of any evidence that the world is nothing but a machine, but because of its rationality. Just so would the Enlightenment bring the Cartesian method from metaphysics to social philosophy (whence, by the way Descartes has expressly excluded it). Doubt and criticism would purge away obscurity and error. Then reason would rebuild the world of humanity, arming herself with the prestige of science, which we know from Newton cannot err.
>
> (1951:153)

Thus, the intention was not to create a science of man but to use reason and the prestige of science to justify one's arguments. As Gillespie states:

> Bentham's relationship to the principle of utility is what Newton's would have been to the law of gravity, had Newton established that law by persuading the planets to obey the inverse square relationships in their own interests.
>
> (1951:154)

The situation was complicated by the philosopher's acceptance of Bacon as the expositor of the scientific method. Scientists, as we have repeatedly shown, are not and were not impressed with Bacon. His approach is not the way of science. Unfortunately for social science, the philosophers did not recognize this. They believed in their search for certainty that the Baconian approach would provide the definitive source of knowledge (Manuel, 1951:29). Newton seemed to confirm this with his "hypotheses non fingo". Unfortunately they did not realize that this was not true, even for Newton who also stated: "No great discovery was ever made without a bold guess" (Selye, 1964:278).

> When Newton said 'I do not make hypotheses', he made them nevertheless in almost all his work. Nothing else could be expected, because, without hypotheses, one cannot formulate the laws which experiment confirms by questioning nature, in other words no induction. Not to have seen this is one of the greatest errors with which one must reproach Bacon.
>
> von Lippman
> (Selye, 1964:278)

Thus from the very outset the emergent social sciences were far removed from contact with a genuinely scientific tradition or philosophy. This lies at the root of contemporary difficulties. Above all, we fail to value our activity in its own right, we search for "signs" of its authenticity, failing to recognize that without faith there can be no knowledge.

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